THE GREEK DEBT CRISIS: AN ECONOMIC ANALYSIS OF POLICY AND STRUCTURAL ANTECEDENTS

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ABSTRACT

This paper explores the economic impact of several Greek policies and institutions on the supply of labor, as they relate to the Greek Debt Crisis. It argues that policies and institutions affect household time allocation and labor supply decisions, including the decision to participate, hours of work, and wages. Using household-level data from the Luxemburg Income Study, I estimate the extent to which these policies influence labor supply decisions, using Probit Maximum Likelihood Estimation, Tobit Maximum Likelihood Estimation, and Ordinary Least Squares Regression.

Keywords: Greece, Time Allocation and Labor Supply, Labor Force Participation

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SECTION 1: INTRODUCTION

Within the larger European Debt Crisis, the Greek Sovereign Debt Crisis looms over the Eurozone, threatening to dismantle the unifying currency. The crisis in the Eurozone began in 2009 when the new finance minster of Greece, George Papakonstaninou, announced that deficit figures provided by the previous government, The New Democracy, were in fact misstated. In violation of the Stability and Growth Pact, the Greek debt was revealed to be 129.7% of GDP in 2009 –more than double the SGP's mandated 60% or less (Akram, Ali, Noreen & Karamat, 2011).

Three years after the initial spark, Greece holds a staggering public debt of 170.6% of GDP, according the 2012 European Commission's Eurostat database. Despite two bailout packages from the European Union and the International Monetary Fund totaling €240 billion, the recovery of Greece without a default on its debt remains uncertain (Plumer, 2011). The prospect of Greek default, and the global repercussions that would ensue, raise a number of questions regarding the antecedents of the crisis and factors that have contributed to Greece's vulnerability.

This thesis explores the economic impact of several Greek policies and institutions on the supply of labor, as they relate to the Debt Crisis. Specifically, this study attempts to answer the following questions: How have policies and institutions in Greece affected household decisions to work and save? What patterns of labor-leisure decisions can be observed by the Greek labor force in the two decades leading up to the crisis, and are these patterns different for men and women? How have these labor-leisure patterns decisions informed the current Crisis? Finally, what are the effects of household labor-leisure decisions on outcomes such as poverty per capita and household well-being?

First, I develop a simple static labor supply model in order to gain a better theoretical understanding of how policies and institutions affect work decisions. The static model elucidates the behavioral incentives imbedded in policies and institutions such as the pension and welfare systems. The model allows me to predict how Greece's policies shape individual decisions on whether to enter the labor force, how many hours to work, and when to retire.

Second, I use this theoretical foundation to motivate the development of my empirical framework. I use household and person-level data from three cross-sections of the Survey on Income and Living Conditions, and analyze the effects of pension eligibility and transfer income on an individual's likelihood to participate in the labor force. I estimate how these policies and programs affect hours of work and labor productivity. Based on these results, I draw conclusions about the efficiency and effectiveness of these welfare programs. This task requires determining whether or not the cost of these programs is within Greece's long-term financial means, whether these policies target Greece's most vulnerable citizens, and if they succeed in ameliorating Greece's depth of poverty.

My thesis assumes that labor supply decisions are partly the result of work incentives imbedded in federal policies and legislation; these policies have broad implications for the well-being of households and the nation's financial solvency. In this study, I attempt to bring these perspectives together in my overall economic analysis of Greece, to determine how household behavior has been shaped by pension policies and welfare generosity. I use macroeconomic data to draw conclusions about the effects of these policies and programs on the well-being of the Greeks and describe the extent to which the inefficiency and unsustainability of these practices led to the Greek Sovereign Debt Crisis.

My thesis is organized as follows. After this introduction, Section 2 reviews the literature relevant on Greek and European labor supply. Section 3 provides a brief profile of Greece, which includes an overview of Greece's geography, demographic composition, and work sectors. Section 3 summarizes the recent history surrounding the Crisis and describes the Greek tax system, pension policies, and the welfare state. Section 4 outlines the static family labor supply model used as the theoretical foundation of this analysis and predicts how Greece's policies affect the supply of labor. Section 5 describes the data, estimation techniques, and empirical model used in my analysis. Section 6 discusses the results of the labor supply analysis, and Section 7 concludes.

SECTION 2: LITERATURE REVIEW[1]

2.1 Greek Labor Supply

Labor supply research is a fundamental component of theoretical and empirical microeconomics that seeks to explain the underlying factors in individual and family employment decisions. Research in this field has measured the labor market consequences of a wide range of public policies including taxes, pensions, and welfare systems. Blundell and MaCurdy (1999) note that there has been a recent shift in labor supply research away from sophisticated estimation techniques toward simpler approaches for explaining work decisions.

Labor force participation rates vary significantly by demographic characteristics, and a large portion of the existing body of literature on Greek labor supply deals with the employment and participation of subpopulations such as women and youth. Many of these studies share common objectives such as identifying the determinants of participation in the labor force,

[1] Table 1 summarizes the key literature related to European and Greek labor supply.

estimating the elasticity of labor supply, and isolating the risk factors for long-term unemployment.

A relatively recent study by Daouli, Demoussis, and Giannakopoulos (2004) used microeconomic data from the National Household Budget Survey to explain the employment patterns of Greek women. Daouli, Demoussis, and Giannakopoulos estimated a Probit Model of Labor Force Participation, an Ordinary Least Squares Regression Model of Wages, and a Tobit Model of hours of work. The econometric results showed that a Greek woman's decision to work is affected by motherhood, previous human capital decisions, where she lives, and other sources of income such as her husband's earnings and non-labor income.

High youth unemployment in Greece makes young people an equally compelling focus of study in labor supply research. Mitrakos, Tsakloglou, and Cholezas (2010) used multivariate probability analysis of micro-data provided by the National Statistical Service of Greece to identify the determinants of unemployment; they emphasized how variables related to age and education influence unemployment. Preliminary descriptive statistics motivated a variation of Heckman's two-stage estimation method, which corrected their results for selection bias. In the first stage, they estimated the probability of labor force participation and used predicted values from this model to adjust for selection bias in the unemployment probability model in the second stage. The dependent variable in the second stage was a dummy variable, equal to one if the individual is unemployed and zero otherwise. The results implied that unemployment is not a problem of age, but is rather a transition from school to employment.

The focus of the labor supply research on specific populations such as women and youth leaves the labor supply of the aggregate labor force largely unexplored. However, the topics these studies address and the estimation techniques they employ provide a useful starting point

for research on the effects of policy on the Greek labor force as a whole. The next section of the Literature Review shows that my paper not only fills the gap in the literature on aggregate labor supply, but also contributes to the literature on the Debt Crisis, which has not yet been examined from a labor supply perspective.

2.2 The Debt Crisis

The existing research on the Greek Debt Crisis falls into two general categories: studies of its implications on Europe and studies of its domestic causes and consequences. My thesis falls into the latter category, and I review only the literature on Crisis antecedents. The available literature on this topic is limited in both quantity and depth. The three journal articles published since 2010, after the onset of the crisis, lack consensus and two of them provide only general summaries of Greece's fiscal situation with little to no econometric analysis.

Arghyrou and Tsoukalas (2011, 186) applied previous literature on currency crises to offer "an analytical treatment of the crisis unfolding in the market for Greek government bonds." They proposed a 'Crisis Model of EMU Exit Under Shifting Expectations' that provided an analytic explanation for the causes and timing of events in Greece. They concluded that the Debt Crisis and its escalation were attributable to two factors: unsustainable fiscal finances over the first decade of the 2000s that were inconsistent with long-term EMU membership, followed by a shift in market expectations from a regime of credible commitment to EMU participation to a regime of non-credible EMU commitment, taking place in late 2009 and early 2010. Further, Arghyrou and Tsoukalas explore the risk of crisis contagion to other EMU countries and argue that periphery countries such as Ireland, Italy, Portugal, and Spain are vulnerable to contagion due to comparable deteriorations in fiscal practices since their accession to the Euro in 1999.

Kotios, Pavlidis, and Galanos (2011) provided a descriptive overview of the Debt Crisis that attributed the Crisis to Greece's unpreparedness for EMU entry and the nation's subsequent failure to make the necessary long-term adaptations. According to Kotois, Pavlildis, and Galanos, "Greece's accession to the EMU was based on a policy of limited adaptation, with an emphasis on just a few nominal macroeconomic indicators and the use of creative accounting, as was later discovered" (2011, 265). Specifically, public debt levels were understated and the Greek drachma was overvalued. As a result, Greece suffered a permanent competitive disadvantage compared to other Eurozone nations, which undoubtedly exacerbated the Crisis.

Finally, Akram, Ali, Noreen, and Karamat (2011) provided another descriptive overview and focused on the policies and institutions that made Greece vulnerable to the Crisis. In a twelve-page summary of Greece's predicament, Akram et al. identified the triggers of the debt crisis as "misstated statistics by the Greek government, weak coordination and organization, high expenditures in comparison to revenues, corruption, tax evasion, weak welfare system, and inflexible employment laws" (2011, 306).

In summary, the existing body of literature on the antecedents of the Greek Debt Crisis provides only a limited description of Greece's situation, pointing to a wide range of causes from a loss of confidence in Greece's long-term solvency to government institutions such as the pension and welfare systems that caused expenditure to grow at a faster rate than revenue. My thesis contributes to existing research by presenting a new perspective on the Crisis using labor supply modeling.

Table 1

Review of Literature

Study	Author(s)	Published By	Region	Data Source	Estimation	Outcomes	Results
The Effects of Taxation on Married Women's Labour Supply Across Four Countries	N. Smith, S. Dex, J. D. Vlasblom, T. Callan	Oxford Economic Papers (2003)	Britain, Denmark, Ireland, Germany	Danish Statistical Bureau, ERSI, German SOEP, British Household Panel Study	Bivariate Probit Model with Self-Selection	Decision to Participate and Extent of Participation (Full-time or Part-time)	Negative and significant effe of children on work decision and extent of participation; negligible effect of age; positive effect of net wage.
Female Labour Force Participation in Greece: Developments and Determining Factors	D. Nicolitsas	The Bank of Greece: Economic Bulletin (2006)	Greece	European Community Household Panel	Probit Model	Probability of Female's Participation in Labor Market	Positive and significant effects of education and work experience; negative and significant effects of husband's income and non-labor income.
Participation of Greek Married Women in Full-Time Paid Employment	J. Daouli, M. Demoussis, N. Gianna-kopoulos	South Eastern Europe Journal of Economics (2004)	Greece	National Household Budget Survey	Probit Model; OLS corrected for selectivity bias; Tobit Model	Probability of Participation; Hours of Work; Wage Estimation; Labor Supply Function	Negative and significant effects of property income, husband's income, and presence of primary school age children in the household; positive and significant effects of education and age.
Social Security and Elderly Labor Supply: Evidence from the Health and Retirement Study	J. P. Vere	Labour Economics (2011)	United States	Panel Data from the Health and Retirement Study	Generalized 2SLS Instrumental Variable Approach	Probability that a Social Security beneficiary will participate in the labor force.	Predicts that each $1000 of annual Social Security income reduces beneficiaries' labor supply by 0.83 hours per week on average.
Job Changes and Hours Changes: Understanding the Path of L. Supply Adjustment	R. Blundell, M. Brewer, M. Francesconi	Journal of Labor Economics (2008)	Greece	British Household Panel Survey	Difference in Differences	Change in total weekly hours of work before and after FC and WFTC	Modest impact of FC on single mothers' hours of work; large positive effects of WFTC on number of hours of work.
Youth Participation in the Greek Labour Market: Developments and Obstacles	D. Nicolitsas	The Bank of Greece: Economic Bulletin (2010)	Greece	NSSG, Labour Force Survey	Hazard Model	Length of Transition from Education to Labor Market	Shorter wait time for married vs. unmarried, older vs. younger, rural vs. urban, higher levels of education vs lower levels.

SECTION 3: THE GREEK CASE

3.1 Country Profile

Greece is a high income OECD country and is located in Southern Europe. Situated between Albania and Turkey, the peninsula also borders the Aegean, the Ionian, and the Mediterranean Seas. Greece is geographically smaller than the state of Alabama and has a correspondingly small capitalist economy. The public sector accounts for approximately 40% of GDP, and the standard of living, as measured by per capita GDP, has historically been approximately two-thirds that of the GDP of leading Eurozone economies. Since the 2009 onset of the financial crisis, however, Greece has faced a long and arduous recession with the economy contracting 2.3% in 2009, 3.5% in 2010, and 6.0% in 2011. In addition, the major world credit rating agencies downgraded Greece's international debt rating to the lowest possible designation, CCC. The EU agreed to provide Greece €240 billion in bailout funds if Greece agreed to adopt a collection of austerity measures. These measures include cuts to government spending, decreases in tax evasion, reform of the health care and pension systems, and restructuring of the labor and product markets to reduce rigidities and increase competitiveness.

3.2 Tax Policies and Tax Culture

The Greek tax system includes the personal income tax, corporate taxation, the VAT and excise duties, and social contributions. There is no local income tax in Greece, so individuals only pay a national income tax. During the period leading up to the crisis, Greece cut the corporate tax rate from 40% in 2001 to a low 25% in 2007, with gradual declines in between. According to the European Commission's publication "Taxation Trends in the European Union" (2011), Greece had a total tax-to-GDP ratio of 30.3% in 2009. This figure falls significantly below the European Union average of 35.8% and the Eurozone average 36.5%.

A new study from the University of Chicago's Booth School of Business shows that Greek tax revenues should be far greater than observed. The 2012 report by Artavanis, Morse, and Tsoutsoura included an estimate of a lower bound of €28 billion in unreported income in 2009. The foregone government revenues from this amount would account for 31% of the budget deficit that year. The relatively low tax rates, coupled with rampant tax evasion have undoubtedly contributed to the Greek Debt Crisis.

3.3 Pension Policies

Pensions also play an important role in the Debt Crisis. The Greek pension system is based on three pillars. The first pillar includes primary and auxiliary pensions. The main primary funds are IKA, OGA, and OAEE, which insure wage earners, farmers, and the self-employed respectively. These are defined-benefit plans and are financed as pay-as-you-go programs. The auxiliary funds of the first pillar provide supplementary pensions that cover all employees and some self-employed individuals. The second pillar, less widespread, consists of occupational pensions. The third pillar most frequently takes the form of a lump-sum life insurance benefit (European Commission, 2010).

Greeks have historically enjoyed a generous pension scheme as compared to other European citizens. The minimum contribution to the system in Greece is fifteen years of work, and full benefits are guaranteed for anyone with a contribution record of 37 years (OECD, 2009). The official unified statutory retirement age of 65, but the effective retirement age remained at a fairly constant level of 61 years between 2002 and 2008 (European Commission, 2010). Earnings-related benefits are calculated by taking an average of income over the last five years of work before retirement –a more generous method than alternatives such as Germany's pension-point system, which takes into account earnings throughout one's entire work-life, due

to the fact that salary tends to increase with tenure. This earnings related benefit is further supplemented with auxiliary funds. The result is a Gross Replacement Rate higher than almost any other Eurozone country, often approaching or exceeding 100% of pre-retirement income (OECD, 2009). In an analysis of the Greek Welfare State, Peter Stathopoulos (1996, 146) writes, "According to EU statistics, a single person who was on average industrial earnings while at work and who met the maximum necessary contribution conditions will receive a retirement pension equivalent to 'as much as 107% of average earnings in Greece, [compared to] 97% in Spain, 94% in Portugal, and 89% in Italy' while in the UK, the Netherlands, and Ireland it is less than 50% of these earnings."

3.4 The Welfare State

The 1980s marked the beginning of sweeping social policy reform in Greece with growing social expenditure on welfare. Between 1980 and 1990, public expenditure as a percentage of GDP rose form 33.1% to 53.3%, with a corresponding increase in social expenditure as a percentage of GDP from 11.1% to 20.9%. During this period, a new state healthcare service was implemented, along with compulsory, state-provided education until the age of 15. Existing programs such as social security, unemployment, housing, and family benefits were broadened. While most Northern European countries expanded their welfare states during times of increased economic growth, the Greek welfare state expanded in less than prosperous conditions. Thus, Greece began taking on debt in order to finance its public services beginning in the 1980s (Stathopoulos, 1996).

While Greece's present-day welfare state is not considered outlandishly generous by European standards, the fragmented structure of the collective scheme makes the welfare state poorly integrated and inefficient. Programs are riddled with overlapping eligibility and coverage

gaps that exclude specific disadvantaged groups such as the long-term unemployed, unemployed youth, women with erratic work histories, and temporary or part-time workers. Instead, the Greek welfare state over-protects white-collar workers and under-protects the groups mentioned above (Matsaganis, 2005). To this point, Greece has the curious problem of high social expenditure but a persistent 12% of the population living or less than 50% of the median household income (OECD, 2011).

SECTION 4: THEORTICAL FRAMEWORK

4.1 The Static Labor Supply Model

The conceptual framework of this project is based on a traditional cross-section labor supply model, from John Pencavel's chapter "The Labor Supply of Men" from *The Handbook of Labor Economics* (1986). This model assumes that each household member has a known fixed block of time, *T*, and divides it between working hours, *h*, and leisure hours, *l*, and the individual is paid a wage rate of *w* for each hour of work.

The optimal allocation of *T* between *h* and *l (T=l+h)* is given by the utility function:

(1) $U_i = U_i(x_i, h_i; A_i, \varepsilon_i)$

i = 1, …, n persons

A = personal characteristics

x = consumption of commodities

h = hours of work

ε = individual's tastes, where ε is unobserved

The individual's budget constraint is given by:

(2) $px_i = wh_i + y_i$

p = fixed per unit price of commodity bundle

w = wage rate

y = non-labor income

We assume the individual chooses values of $x > 0$ and $h \geq 0$ to maximize equation (1), subject to the constraints of equation (2) and the time constraint. Choosing $h > 0$ is considered to be an interior solution while $h = 0$ is a corner solution. By the first-order condition for a constrained maximum, the individual chooses working hours and commodities such that the negative of the marginal rate of substitution of working hours for commodities is equal to the real wage.

(3) $$\frac{w}{p} = -m(x, h; A, \varepsilon) = -\frac{\partial U/\partial h}{\partial U/\partial x}$$

The model of individual labor supply can be adapted to a family labor supply model by assuming that an individual's utility depends on his own working hours (h_1) and his spouse's working hours (h_2). This would lead to a new utility function and budget constraint, as well as two time constraints:

(4) $$U_j = U_j(x_{1j}, h_{1j}, h_{2j}; A_j, \varepsilon_j) \qquad j = 1, \ldots, n \text{ households}$$

(5) $$p_1 x_{1j} + p_2 x_{2j} = w_1 h_{1j} + w_2 h_{2j} + y_j$$

In this case, the problem is to select x_1, x_2, h_1, and h_2 so as to maximize household utility, given by utility function (4) and subject to the budget constraint (5). For simplicity's sake, we assume that the household's utility function reflects the preferences of the head of the household. This is the dictator model of household decision-making.

Finally, the decision to work is influenced by the individual's reservation wage, w^*, which Pencavel defines as, "the individual's implicit value of his time when at the margin between participating in the labor market and not participating" (1986, 29). A market wage rate of, w, implies that the market places a value of w on the individual's time. If $w > w^*$, then the individual supplies $h > 0$ hours of work. On the other hand, if $w \leq w^*$, then $h = 0$.

4.2 The Effect of Pensions

Pensions affect the supply of labor by influencing the decision to retire. According to Ehrenberg and Smith (2012, 225), a worker deciding whether or not to retire faces three basic considerations: "the present value of income available to him over his remaining life expectancy if he retires now, the change in this sum if retirement is delayed, and preferences regarding household time and the goods one can buy with money." Several aspects of a country's pension scheme directly affect these factors. For instance, entitlement age, the replace rate of income, and pension accrual rates all determine the duration and size of entitlement benefits and thus the present value of income over the lifespan. Similarly, pension contributions are the cost of continued work, so we expect high contributions to encourage retirement. In this way, pension schemes can compel older workers to either exit or remain in the labor force (Fields & Mitchell, 1984).

Intuitively, I expect pension eligibility in Greece to significantly decrease the probability of labor force participation. Greece's minimum contribution requirement of fifteen years of work and full benefit guarantee after 37 years means that most Greek citizens who enter the work force after secondary education are eligible for full benefits at age 59. Meanwhile, the near 100% replacement rate of pre-retirement income decreases the chance of significant income loss upon retirement and lowers the cost of exiting the labor force. For these reasons, I predict a negative and significant effect of pension eligibility on the labor supply of Greek men and women across time.

4.4 The Effect of Transfers

The effect of welfare payments on labor supply can be broken down into income and substitution effects. Transfer payments generate an income effect that induces recipients to buy

more normal goods and services, including leisure, leading to a reduction in hours of work. If benefits are inversely tied to labor income, then the program also creates a substitution effect. The substitution effect lowers the opportunity cost of non-work, causing the recipient to substitute leisure for work and thus further reducing the individual's labor supply (McConnel, Brue, & Macpherson, 2010). Work-related transfers are excluded from my participation model for reasons of endogeneity. However, the income effects of welfare payments predict negative and significant correlation between transfer income and the probability of participation for both men and women.

SECTION 5: DATA AND ESTIMATION

5.1 Data

The Luxembourg Income Study is my primary source for microeconomic data. I use household-level and person-level files from the 1995, 2000, 2004, 2007, and 2010 cross sections of the Household Income and Living Survey, and I construct separate data sets for men and women ages 16 to 70. Table 2 gives the number of observations in each cross section.

Table 2 **Observations**

Year	Men	Women
1995	5,165	5,496
2000	4,067	4,299
2004	5,362	5,665
2007	6,036	6,337
2010	5,244	5,481

Regional variables are categorical and determined according to the Nomenclature of Territorial Units for Statistics Class 1 (NUTS1), which separates Greece into four regions: Northern Greece, Central Greece, Attika, and the Aegean Islands & Crete. Educational variables are also categorical by highest completed level of education (low, medium,

high). The remaining variables are continuous and non-negative: age, number of children in the household under age 5, household capital income, and various sources of transfer income. A complete table of descriptive statistics, by gender, for each cross section is presented in Appendix B.

The World Bank database, World Development Indicators, provides macroeconomic data on Greece from 1980 to 2011. I use this database and Eurostat for descriptive purposes to put my microanalysis into better context. This involves observing Greece's trends in public debt, tax revenue, social expenditure, demographic composition, poverty per capita, and other salient statistics. This information is presented in graphical form in Appendix B and is referred to in Section 7 Results and Section 8 Conclusions.

5.2 Estimation Methodology

5.2.1 Probit Maximum Likelihood Estimation

The Probit model is a binary response model in which the dependent variable can take on the values 0 or 1. In general, I am interested in the response probability

$$P(y = 1|x) = G(\beta_0 + \beta_1 x_1 + \cdots + \beta_k x_k) = G(\beta_0 + \boldsymbol{x\beta}) \tag{6}$$

where G is the standard normal cumulative distribution function,

$$G(z) = \Phi(z) = \int_{-\infty}^{z} \sqrt{2\pi} \exp\left(-\frac{v^2}{2}\right) dv \tag{7}$$

$\boldsymbol{x}$ is a matrix of explanatory variables and $\boldsymbol{\beta}$ is a vector of their corresponding parameters.

I use maximum likelihood estimation (MLE), to estimate the probit model. MLE takes a set of observations and finds the parametric values that make the observed results most probable given the model. Maximum likelihood estimation is based on the distribution of y|**x**, so it inherently accounts for the heteroskedasticity in Var(y|**x**), the conditional variance of y.

Because of the non-linear nature of the Probit MLE, we cannot interpret the β coefficients of the probit regression as we would interpret OLS parameters. For instance, β_k in the Probit model cannot be interpreted as the impact of a one-unit change in x_k on y as it would in OLS. Rather, the chain rule shows that the marginal effects for continuous variables in the probit model are given by:

$$(8) \qquad ME = \frac{\partial P(y=1|x)}{\partial x} = \frac{\partial G(x\beta)}{\partial x} = g(x\beta)\beta, \qquad \text{where } g(z) \equiv \frac{\partial G(z)}{\partial z}$$

where $g(.)$ is the probability density function of the standard normal distribution.

For dummy variables, the marginal effect is $G(x\beta \,|dv=1) - G(x\beta \,|dv=0)$.

These effects are of less interest in the Probit framework than in OLS regression. In a binary response model, a marginal effect is the effect of a small change in x on the probability of success ($y = 1$). As the purpose of this thesis is to identify factors that positively and negatively influence the decision to work, it is sufficient to observe the direction of the $\beta_{k,}$ which gives the sign of the partial effect of x_j on P(y|**x**), and to consider the statistical significance of x_j, as determined by a standard hypothesis test at a chosen level of significance (Wooldridge, 2009).

I use probit analysis to estimate the probability of labor force participation. The specification of the model is given in Table 2[2]:

Table 2

Dependent Variable	**Independent Variables**	
Labor Force Participation	Region	Maternity Transfers
	Level of Education	Family Assistance
	Age	General Assistance
	# Household Members Under Age 5	Educational Transfers
	Household Capital Income	Intrahousehold Transfers
	Old Age Transfer Income	Alimony Income
	Disability Transfers	

[2] Appendix C includes definitions of all variables

5.2.2 Tobit

A selection problem arises when estimating hours of work –that is, if an individual does not participate in the labor force, then we cannot observe the optimal number of hours that he or she would choose to work. In fact, the data on weekly hours of work reflects this by showing a cluster of the population (nonworking individuals) logging zero hours, followed by a roughly continuous range of strictly positive values recorded by the working population. One could exclude the zero-value data and estimate an expected value for hours of work based strictly on the data of working individuals. However, this would yield negative fitted values for cases without hours recorded, and could lead to a negative prediction of *y*.

Intuitively, a negative prediction of *y* does not make sense given the non-negative nature of working hours. This implies the need of a model that will yield strictly non-negative predictions of *y*. The Tobit model is commonly used in labor supply research for this purpose. The Tobit model expresses the observed response, *y*, in terms of a latent variable y^*:

$$y^* = \beta_0 + \boldsymbol{x\beta} + u, \quad u|\boldsymbol{x} \sim \text{Normal}(0, \sigma^2) \tag{9}$$

$$y = \max(0, y^*) \quad \Rightarrow \quad y = \begin{cases} y^*, & y^* \geq 0 \\ 0, & y^* < 0 \end{cases} \tag{10}$$

By construction, *y* has a continuous distribution over strictly positive values. Further, *y* given $\boldsymbol{x}$ has the same density as y^* given $\boldsymbol{x}$ for positive values:

$$P(y = 0|\boldsymbol{x}) = P(y^* < 0|\boldsymbol{x}) = P(u < -\boldsymbol{x\beta}|\boldsymbol{x}) = P(u/\sigma < -\boldsymbol{x\beta}/\sigma|\boldsymbol{x}) \tag{11}$$

$$= \Phi(-\boldsymbol{x\beta}/\sigma) = 1 - \Phi(\boldsymbol{x\beta}/\sigma)$$

Recall u/σ has a standard normal distribution and is independent of **x**. Then (11) implies that a random draw ($\mathbf{x}_i$, y_i) from the population has a conditional density $f_{y_i|\mathbf{x}_i}$ given by:

$$\ell_i(\boldsymbol{\beta}, \sigma) = 1(y_i = 0)\log\,[1 - \Phi[(y - \boldsymbol{x_i\beta})/\sigma], \quad y > 0 \tag{12}$$

$$P(y_i = 0|x_i) = 1 - \Phi(\boldsymbol{x_i\beta}/\sigma) \tag{13}$$

As always, Φ is the standard normal density function. From (12) and (13) I can obtain a log-likelihood function for each observation, as well as a log-likelihood function for the random sample. Then, by maximizing the log-likelihood, I can obtain maximum likelihood estimates for $\boldsymbol{\beta}$ and $\boldsymbol{\sigma}$ (Wooldridge, 2009).

Like the Probit model, the expected values of y given **x** depends on $\boldsymbol{\beta}$ and $\boldsymbol{\sigma}$ in nonlinear ways. Further, we see that $\boldsymbol{\beta_j}$ measures the partial effects of $\boldsymbol{x_j}$ on y^* rather than y. Thus, two expectations are of interest: $E(y|y > 0, \boldsymbol{x})$ and $E(y|\boldsymbol{x})$. The former can be interpreted, for given values of $\boldsymbol{x}$, as the expected value of y when y is positive. In my case, it is the expected value of hours of work given the individual's characteristics ($\boldsymbol{x}$) and the fact that he or she indeed works ($y > 0$). Given $E(y|y > 0, \boldsymbol{x})$, we can calculate $E(y|\boldsymbol{x})$, the expected value of hours of work given the individual's characteristics ($\boldsymbol{x}$). Then, taking the partial derivatives of these expected values with respect to x_j tells us the change in hours of work for a working individual weighted by the probability of choosing to work. The derivative also accounts for the fact that an individual on the margin ($y = 0$) might choose to work ($y > 0$) given a change in x_j. It is important to note that the validity on these Tobit parametric estimates hinges on the normality and homosekdasticity in the underlying latent variable model. Departures for these assumptions make it difficult to know what the Tobit Maximum Likelihood Estimation is estimating (Wooldridge, 2009).

5.2.3 Ordinary Least Squares, Heckman Correction

A similar selection bias arises when we estimate wages: employed individuals will tend to have higher wages than those not in the labor force would have. Thus, if we estimate wages on the employed alone, our predicted value will be skewed upward. The Heckman Correction addresses this sample selection problem using a two-step estimator. In the first stage, a Probit

model is used to estimate the employment probability for each individual. This vector of estimators is used in the second stage as an explanatory variable to correct for self-selection into the work force.

The wage equation is given by (14), where w_i is the market wage, $\boldsymbol{x}_i$ is a vector of explanatory variables relating to person's productivity, and ε_i is an error term.

(14) $$w_i = \boldsymbol{\beta x}_i + \varepsilon_i$$

Let w^*_i be the individual's reservation wage, or the minimum wage at which the i^{th} individual will choose to work. Then the difference between the market wage and the reservation wage is given by Equation (15).

(15) $$E^*_i = w_i - w^*_i$$

Recall from Section 4.1, if $w_i > w^*_i$, then the individual supplies $h > 0$ hours of work. On the other hand, if $w_i \leq w^*_i$, then $h = 0$. We can model the difference E^*_i as follows:

(16) $$E^*_i = \boldsymbol{z_{i\gamma}} - u_i$$

The Heckman Correction Model adopts three assumptions.

(17) $$(\varepsilon_i, u_i) \sim Normal(0, 0, \sigma^2_\varepsilon, \sigma^2_u, \rho_{\varepsilon u})$$

This assumption means the error terms in our wage and employment equations are normally distributed with mean 0, and have the variances and correlation coefficient designated.

(18) (ε, u) is independent of $\boldsymbol{x}$ and $\boldsymbol{z}$

This means the error terms are independent of the explanatory variables.

(19) $$Var(u) = \sigma^2_u = 1$$

Finally, this is a simplifying assumption used to normalize the error term the first-stage Probit regression.

The expectation of the wage equation (14) conditioned on working gives:

(20) $$E(w_i|\, E_i = 1, \boldsymbol{x}_i) = E(w_i|\, \boldsymbol{x}_i \boldsymbol{z}_i u_i) = \boldsymbol{\beta x_i} + E(\varepsilon_i|\, \boldsymbol{x}_i \boldsymbol{z}_i u_i)$$

where the final term can be simplified using the fact that employment is independent of x_i and only depends on z_i and u_i. This means:

(21) $$E(w_i|\, E_i = 1, \boldsymbol{x}_i) = \boldsymbol{\beta x_i} + E(\varepsilon_i|E_i = 1) = \boldsymbol{\beta x_i} + E(\varepsilon_i|u_i > -\boldsymbol{z_{i\gamma}})$$

since the individual works ($E_i = 1$) only if the difference between the market wage and the reservation wage is positive ($E^*_i > 0 \rightarrow \boldsymbol{Z_i\gamma} + u_i > 0 \rightarrow u_i > -\boldsymbol{z_i\gamma}$).

As discussed earlier, the Heckman method corrects for sample selection bias by estimating employment probability. Here, employment probability is proxied by our error term ($\varepsilon_i|\, u_i > -\boldsymbol{z_{i\gamma}}$). In terms of our error, the cause of the bias is that u is bounded from below by z and this criterion excludes individuals from the regression. We can model this omitted variable by estimating the expectation:

(22) $$E(\varepsilon_i|\, u_i > -\boldsymbol{z}_{i\gamma}) = \rho_{\varepsilon_i u_i}\lambda_i(-\boldsymbol{z}_{i\gamma}) = \beta_\lambda \lambda_i(-\boldsymbol{z}_{i\gamma})$$

where $\lambda_i(-\boldsymbol{z}_{i\gamma})$ is the inverse Mill's ratio evaluated at $-\boldsymbol{z}_{i\gamma}$.

The inverse Mill's ratio is the ratio between the standard normal probability density function and the standard normal cumulative distribution evaluated at the indicated point (Wooldridge, 2009). Equation (22) is derived as follows:

(23) $$E(u_i|\, u_i > -\boldsymbol{z}_{i\gamma}) = \frac{\varphi(-\boldsymbol{z}_{i\gamma})}{1-\Phi(-\boldsymbol{z}_{i\gamma})}$$

To obtain $E(\varepsilon_i|\, u_i > -\boldsymbol{z}_{i\gamma})$ from (23), we simply multiply the quantity by the covariance of ε_i and u_i. Recall, the third assumption sets $\sigma^2{}_u = 1$. Then, using the identity:

(24) $$\rho_{\varepsilon_i u_i} = \frac{\sigma_{\varepsilon u}}{\sigma_\varepsilon \sigma_u}$$, we obtain $\sigma_{\varepsilon u} = \rho_{\varepsilon_i u_i}\sigma_\varepsilon$

Thus, (25) $$E(\varepsilon_i|\, u_i > -\boldsymbol{z}_{i\gamma}) = \rho_{\varepsilon_i u_i}\sigma_\varepsilon \frac{\varphi(-\boldsymbol{z}_{i\gamma})}{1-\Phi(-\boldsymbol{z}_{i\gamma})} = \beta_\lambda \lambda_i(-\boldsymbol{z}_{i\gamma})$$

SECTION 6: RESULTS

6.1 Labor Force Participation

The results of the model estimated in my thesis are consistent with the labor supply trends of men across Europe for the past two decades; labor force participation rates among older workers are low and transfer income significantly decreases the probability of participation (Borsch-Supan, 2000). In 1995, the variables significantly affecting labor supply participation, as defined by holding a job or seeking work, were (1) level of education, (2) age (and age squared), (3) children in the household under age five, (4) household capital income, (5) old age insurance, (6) disability insurance, and (7) intra-household transfer income. Education and number of children under age five positively influence participation, age has a nonlinear relationship with labor force participation that peaks at age 30-35 for women and 35-40 for men, and the remaining five variables decrease the probability that an adult is active in the labor force. These results make intuitive sense because higher levels of education are correlated with higher wages, which would increase the opportunity cost of unemployment. We expect children under the age of five to increase the probability of labor force participation for men if men are the traditional breadwinners in the household.

In 2000, household unemployment transfers have a negative effect on LFP, as family assistance, general assistance, and educational assistance in 2004. The pattern suggests that an increasing number of individuals who do not participate in the labor force but collect transfer income. This growth in welfare dependency may be a result of the expansion of Greece's welfare state over this period. According to Sotiropoulos (2009), Greece's public expenditure on social protection as a share of GDP grew from 18.6% in 1995 to 22.1% in 2003. In fact, Greece's social expenditure is strictly upward sloping from 1968 to 2003 in what some researchers call the

"Europeanization" of Greece's Welfare State as Greece's welfare effort converged to the standards of Western Europe. Sotiropoulos notes that while Greece's social expenditure is comparable now to the EU-15, the decline in Greece's poverty rate after social transfers were distributed is still small, which draws attention to the ineffectiveness of Greece's expensive system.

Across all years in my study, women show a similar pattern as men with regard to the effects of education and age on LFP; however, the number of children under age five, household income, and transfer payments are negatively associated with LFP. This change in the effect of number of children under age five is consistent with my assumption that men are the primary breadwinners and women the primary caretakers. In 1995 and 2000, old age insurance and disability transfers did not significantly affect a woman's labor force participation decision, while family assistance reduced the probability of participation. Interestingly, in 2004 the participation decisions of men and women seem to converge, with old age insurance, disability transfers, and general assistance reducing LFP for both groups.

While the expansion of the welfare system could account for the increased significance of transfer income over time, a concurrent shift in the peak participation age of women from age 26 – 30 in 2000 to age 31 – 35 in 2004 suggests more women may be choosing to work and staying in the work force longer. Indeed, nearly all of Europe witnessed an increase in the labor supply of women over the past twenty years (Thevenon, 2009). However, Greece's female participation rate has historically been significantly lower than the EU average, so this shift in peak participation after Greece's accession into the EMU in 2001 raises an important question for future research: Did Greece's entry into the EMU alter the markets such that more women

chose to participate, did Greece's entry result in a change in the working preferences of women, or did other factors cause this change in female participation rate?

6.2 Hours of Work

The results of the Tobit regression show statistically significant effects of age and education on an individual's weekly hours of work, but little or no effects by other variables. A likely explanation for the unresponsiveness of weekly hours to the variables in our models is the labor market rigidity in Greece. Kouzis (2011) adopts a multidimensional definition of labor market rigidity as inflexibility in wage setting, dismissal of workers, types of work, and hours of work. Using these criteria, Kouzis claims that Greece's labor market has historically been rigid despite an array of policy initiatives over the past twenty years to increase flexibility. These initiatives have increased the prevalence of part-time and temporary work, reduced the length of required dismissal noticed, reduced the cost of overtime, and have introduced a collection of changes to the collective bargaining system (Kouzis, 2011).

The Fraser Institute supports Kouzis' claim of labor market inflexibility. In their Annual Report on the Economic Freedom of the World, the Fraser Institute uses data from the IMF, the World Bank, and the World Economic Forum to index countries by their economic freedom. They define economic freedom as the extent to which individuals are able to make their own choices and engage in voluntary exchanges without harming the person or property of others. The Institute's index measures the economic freedom in 5 areas of an individual's market life: size of government, legal system and security of property rights, sound money, freedom to trade internationally, and regulation. Within these areas, there are 24 components that can be further divided into 42 variables. However, for the purpose of this thesis we are primarily concerned with labor market regulation. Labor market regulation is evaluated based on 6 variables: hiring

regulation and minimum wage, hiring and firing regulations, centralized collective bargaining, hours regulations, mandated cost of worker dismissal, and conscription. The Fraser Institute's 2012 Annual Report on the Economic Freedom of the World, based on 2010 data, rates Greece last among Eurozone countries in labor market freedom (Gwartney, Hall, & Larson, 2012). This implies tight market regulations governing hours of work and explains the outcome we see in our Tobit regression: once a worker selects into the labor force, he or she has little economic freedom in choosing hours or wages due to rigid regulations on these aspects of the market.

Given the prevalence of tax evasion in Greece, the unresponsiveness of weekly hours to other variables in the model might also be explained by misreported hours of work –that is, individuals who are misreporting hours might log a "standard" amount of work time. This could also explain the strong negative effect of higher levels of education on hours of work. Because workers with higher levels of education often earn higher wages, these individuals face greater incentives to misreport hours than their less educated counterparts who earn lower wages.

6.3 Wages

For both men and women and in every year studied, the results of the Ordinary Least Squares wage regression show a statistically significant coefficient on the inverse Mill's ratio variable, lambda. This lends evidence to the presence of a selection bias and we can interpret the sign of lambda as the direction of the bias. A negative sign indicates that unmeasured variables that increase the probability of participation decrease the wage rate; conversely, a positive sign on lambda means that unmeasured variables that increase the probability of participation increase the wage rate. I will use the term "ability" to capture these unmeasured variables that increase the probability of participation. Thus, The positive lambda coefficients we observe on our samples of women indicate that women of higher "ability" are selecting into the labor force,

while the negative coefficient we observe on men tells us the men of lower "ability" are selecting in. Again, the lack of responsiveness in wages we observe might be attributable to the rigidity of the Greek labor market. However, it is worth noting that we observe less significant lambdas over time, which implies weaker selection biases. This could be a result of the previously mentioned policy efforts to increase labor market flexibility (Kouzis, 2011).

SECTION 7: CONCLUSION

The purpose of this study was to identify the major factors that influence labor force participation, hours of work, and market wages in Greece. The results show a parabolic relationship between age and the decision to work, with peak participation at age 25-30 for women and 35-40 for men. Level of education and age were found to positively and significantly influence the decision to participate in the labor force, while transfer income variables were found to decrease the probability of participation. Hours of work and wages were only significantly affected by age and education. The unresponsiveness of hours and wages to variables in the model support the theory that the labor market in Greece is rigid and tightly regulated. As a result, my thesis research will have greater implications on the selection side, than the hours or wage side. Indeed, the results of the OLS wage regression show evidence of sample selection bias. Interpreting these results with our knowledge of Greek structures and institutions, we may infer that Greece's collapse was a perfect storm of rigid markets, disincentives to work, and unsustainably generous social programs.

APPENDIX A: DEFINITIONS OF VARIABLES

Variable	Notation	Definition
region	region (#categorical)	Region of the residence of the household at the date of interview. #s denote region by Nomenclature of Territorial Units for Statistics Class 1.
education	educ (#categorical)	Recode of highest completed level of education into three categories based on the International Standard Classification of Education from - low: less than secondary education completed - medium: secondary education completed - high: tertiary education completed
age	age	Age in years
number of household members under age 5	# kids < 5	Number of household members under age 5
household capital income	hhcapital	Monetary payments received in counterpart for providing capital (including financial and non-financial assets).
household old-age insurance public pensions	old age	Employment-related periodic payments from public pension system intended to maintain the income of the beneficiary after retirement from gainful employment at the standard retirement age
household old-age disability public pension	disability	Employment-related periodic payments from public pension system intended to maintain or support the income of someone who suffers from a (non-work-related) disability that impairs his or her ability to work or earn beyond a minimum level laid down by legislation.
household unemployment wage replacement	unemployment	Full or partial unemployment insurance benefits, vocational training benefits, relocation benefits, and other benefits from unemployment insurance.
household family universal benefits	family	Cash payments for child or family allowances not relating to maternity/paternity/child care leave from employment.
household general assistance	general	Minimum income gaurantee (MIG) programs, covering the totality (or almost) of the population.
household educational transfer income	educational	Monetary and non-monetary assistance for education expenses
household intra-household transfer income	intrahh	Regular cash and non-cash private transfers.

Source: Luxemburg Income Study Variable Definition List

APPENDIX B: DESCRIPTIVE STATISTICS

Females 1995

HOUSEHOLD

Variable	Obs	Weight	Mean	Std. Dev.	Min	Max
hh weight	5483	10796.4738	2.461908	1.242999	.2190705	9.147739
hh income	5403	10649.4217	3913940	2972454	-10000	5.25e+07
hh capital	5483	10796.4738	226725.1	684773.2	-10000	1.08e+07
old age	5483	10796.4738	6796.918	83067.66	0	2940000
disability	5483	10796.4738	36703.39	238843.8	0	4752000
unemployment	5483	10796.4738	4329.314	28269.35	0	780000
family	5483	10796.4738	18972.9	87350.25	0	2520000
general	5482	10793.958	9569.545	137965.6	0	4800000
educational	5483	10796.4738	1898.994	47598.83	0	2400000
housing	5483	10796.4738	1787.883	23759.51	0	660000
intrahh	5483	10796.4738	41200.94	240674.8	0	5700000
# kids < 5	5483	10796.4738	.1632231	.4555357	0	3

Region, NUTS1 classification	Freq.	Percent	Cum.
[1]Voreia Ellada	1,733.6047	31.62	31.62
[2]Kentriki Ellada	1,043.5809	19.03	50.65
[3]Attiki (incl. greater Athens)	2,133.7648	38.92	89.57
[4]Nisia Aigaiou, Kriti	484.695111	8.84	98.41
.	87.3545333	1.59	100.00
Total	5,483	100.00	

PERSON

Variable	Obs	Weight	Mean	Std. Dev.	Min	Max
p weight	5483	3895.12317	.8882008	.4484458	.0790357	3.300297
age	5483	3895.12317	44.74569	16.5889	17	74
unemployment	5483	3895.12317	1486.416	17388.28	0	732000

highest completed education level (3-category recode)	Freq.	Percent	Cum.
[1]low	3,256.6078	59.39	59.39
[2]medium	1,533.3347	27.97	87.36
[3]high	557.7522	10.17	97.53
.	135.305288	2.47	100.00
Total	5,483	100.00	

female lfp	Freq.	Percent	Cum.
0	3,250.6115	59.29	59.29
1	2,232.3885	40.71	100.00
Total	5,483	100.00	

Females 2000

HOUSEHOLD

Variable	Obs	Weight	Mean	Std. Dev.	Min	Max
hh weight	4321	11029.0412	3.465657	1.997512	.2189479	16.66578
hh income	4296	10983.8586	5691844	4126886	-210000	4.31e+07
hh capital	4300	10990.3199	333110.4	1044568	0	2.20e+07
old age	4299	10988.7656	23137.92	221294.2	0	5440000
disability	4300	10990.3199	36124.43	244775.6	0	4074000
unemployment	4300	10990.3199	30291.63	161876	0	4725000
family	4300	10990.3199	23187.08	113623.6	0	2472000
general	4321	11029.0412	3641.706	41439.61	0	1024200
education	4300	10990.3199	1285	75599.44	0	6000000
housing	4321	11029.0412	472.7118	9466.611	0	264000
intrahh	4300	10990.3199	35025.97	230612	0	5700000
# kids < 5	4321	11029.0412	.1399325	.423649	0	4

Region, NUTS1 classification	Freq.	Percent	Cum.
[1]Voreia Ellada	1,389.5295	32.16	32.16
[2]Kentriki Ellada	865.164031	20.02	52.18
[3]Attiki (incl. greater Athens)	1,614.9452	37.37	89.55
[4]Nisia Aigaiou, Kriti	375.317328	8.69	98.24
.	76.0439277	1.76	100.00
Total	4,321	100.00	

PERSON

Variable	Obs	Weight	Mean	Std. Dev.	Min	Max
p weight	4321	3960.9745	1.244657	.7173873	.078633	5.985355
age	4321	3960.9745	45.00462	16.62625	17	74
unemployment	4321	3960.9745	11149.71	83362.77	0	1260000

highest completed education level (3-category recode)	Freq.	Percent	Cum.
[1]low	2,287.0548	52.93	52.93
[2]medium	1,453.7857	33.64	86.57
[3]high	511.511968	11.84	98.41
.	68.6475275	1.59	100.00

female_lfp	Freq.	Percent	Cum.
0	2,454.0728	56.79	56.79
1	1,866.9272	43.21	100.00
Total	4,321	100.00	

Females 2004

HOUSEHOLD

Variable	Obs	Weight	Mean	Std. Dev.	Min	Max
hh weight	5648	10234.2562	2.54102	1.440669	.1314933	12.25351
hh income	5648	10234.2562	23153.55	17552.15	-18260	221550
hh capital	5648	10234.2562	1072.502	3707.5	0	112500
old age	5648	10234.2562	3754.673	7048.032	0	77760
disability	5648	10234.2562	193.7915	1170.558	0	19040
unemployment	5648	10234.2562	101.9727	600.3356	0	14680
family	5648	10234.2562	127.4187	500.2486	0	12580
general	5648	10234.2562	54.74023	303.9844	0	3954
education	5648	10234.2562	16.51248	326.4754	0	9000
intrahh	5648	10234.2562	290.0858	1417.169	0	21000
nhhmem5	5648	10234.2562	.164577	.4608917	0	5

Region, NUTS1 classification	Freq.	Percent	Cum.
[1]Voreia Ellada	1,791.5118	31.71	31.62
[2]Kentriki Ellada	1,088.0297	19.27	50.98
[3]Attiki (incl. greater Athens)	2,133.7648	40.03	91.01
[4]Nisia Aigaiou, Kriti	507.52991	8.99	100
Total	5,648	100.00	

PERSON

Variable	Obs	Weight	Mean	Std. Dev.	Min	Max
p weight	5648	3834.87753	.9521453	.5398331	.0492719	4.591513
age	5648	3834.87753	44.68795	16.11347	17	74
unemployment	5648	3834.87753	48.38569	349.1115	0	6445

highest completed education level (3-category recode)	Freq.	Percent	Cum.
[1]low	2,594.6492	45.94	45.94
[2]medium	1,703.0614	30.15	76.09
[3]high	925.234958	16.38	92.47
.	425.054401	7.53	100.00
Total	5,648	100.00	

female_lfp	Freq.	Percent	Cum.
0	2,811.8365	49.78	49.78
1	2,836.1635	50.22	100.00
Total	5,648	100.00	

Females 2007

HOUSEHOLD

Variable	Obs	Weight	Mean	Std. Dev.	Min	Max
hh weight	6337	10246.6512	2.137422	1.286127	.1691195	19.59684
hh income	6337	10246.6512	34433.18	29792.45	-81214	510694
hh capital	6250	10088.7441	1506.644	6466.383	0	129173
old age	6249	10088.4957	5116.721	9583.282	0	120000
disability	6250	10088.7441	237.0728	1413.254	0	21801
unemployment	6250	10088.7441	192.928	1074.213	0	30000
family	6337	10246.6512	148.0654	551.3973	0	9524
general	6250	10088.7441	98.08768	522.3255	0	13680
educational	6249	10088.4957	19.50141	387.3901	0	12240
housing	6337	10246.6512	25.45551	219.9476	0	3600
intrahh	6250	10088.7441	427.7733	2054.147	0	36000
# kids < 5	6337	10246.6512	.152237	.4493076	0	5

region of residence(NUTS 1)	Freq.	Percent	Cum.
[1]Voreia Ellada	2043.91923	32.25	32.25
[2]Kentriki Ellada	1209.98275	19.10	51.35
[30]Attiki	2,461.9281	38.85	90.20
[4]Nisia Aigaiou, Kriti	621.169839	9.80	100.00
Total	6,337	100.00	

PERSON

Variable	Obs	Weight	Mean	Std. Dev.	Min	Max
p weight	6337	3842.53394	.8015416	.4823027	.0634205	7.348892
age	6337	3842.53394	44.85695	15.92692	17	74
unemployment	6306	3822.23723	62.95038	465.6093	0	16556

highest completed education level (3-category recode)	Freq.	Percent	Cum.
[1]low	2,698.2434	42.58	42.58
[2]medium	2,334.8806	36.85	79.42
[3]high	1,270.4033	20.05	99.47
.	33.4727601	0.53	100.00
Total	6,337	100.00	

female_lfp	Freq.	Percent	Cum.
0	3,048.3944	48.10	48.10
1	3,288.6056	51.90	100.00
Total	6,337	100.00	

Females 2010

HOUSEHOLD

Variable	Obs	Weight	Mean	Std. Dev.	Min	Max
hh weight	5481	9962.84622	3.057094	2.24315	.0739393	16.47474
hh capital	5333	9599.72528	1252.373	4873.573	0	127127
old age	5333	9599.72528	6190.55	13047.33	0	216255
disability	5332	9597.94941	300.4889	1810.992	0	26940
unemployment	5330	9598.38331	346.5657	1502.064	0	27443
family	5481	9962.84622	205.743	668.9218	0	8338
general	5333	9599.72528	144.2771	751.7962	0	9147
educational	5333	9599.72528	19.6916	416.9094	0	12000
housing	5481	9962.84622	13.61202	183.5541	0	4620
intrahh	5333	9599.72528	365.6319	1551.419	0	20000
# kids < 5	5481	9962.84622	.1395559	.4243407	0	4

region of residence(NUTS 2)	Freq.	Percent	Cum.
[1]Voreia Ellada	1750.43775	31.94	31.94
[2]Kentriki Ellada	1012.97328	18.48	50.42
[30]Attiki	2,208.4262	40.29	90.71
[43]Kriti	509.162734	9.29	100.00
Total	5,481	100.00	

PERSON

Variable	Obs	Weight	Mean	Std. Dev.	Min	Max
p weight	5481	3765.81978	1.15554	.8478802	.0279481	6.227227
age	5481	3765.81978	45.35617	15.6554	17	74
unemployment	5406	3690.47174	126.3135	805.7376	0	14036

highest completed education level (3-category recode)	Freq.	Percent	Cum.
[1]low	1,905.7533	34.77	34.77
[2]medium	2,181.9903	39.81	74.58
[3]high	1,283.59038	23.42	98.00
.	109.666052	2.00	100.00
Total	5,481	100.00	

female_lfp	Freq.	Percent	Cum.
0	2,552.8145	46.58	46.58
1	2,928.1855	53.42	100.00
Total	5,481	100.00	

Males 1995

HOUSEHOLD

Variable	Obs	Weight	Mean	Std. Dev.	Min	Max
hh weight	5152	9788.65648	2.394629	1.263302	.2190705	9.147739
hh capital	5152	9788.65648	232709.6	683977.7	-10000	1.05e+07
old age	5152	9788.65648	7225.232	89206.98	0	2940000
disability	5152	9788.65648	36349.21	239450.3	0	4752000
unemployment	5152	9788.65648	4926.522	28870.59	0	780000
family	5152	9788.65648	21073.18	96184.4	0	2520000
general	5152	9788.65648	9037.216	135380.1	0	4800000
educational	5152	9788.65648	1869.612	48913.31	0	2400000
housing	5152	9788.65648	1647.803	22431.54	0	660000
intrahh	5152	9788.65648	29181.58	192647.7	0	4500000
# kids < 5	5152	9788.65648	.1727363	.4695293	0	3

Region, NUTS1 classification	Freq.	Percent	Cum.
[1]Voreia Ellada	1,623.9653	31.52	31.52
[2]Kentriki Ellada	1,067.7857	20.73	52.25
[3]Attiki (incl. greater Athens)	1,903.9481	36.96	89.20
[4]Nisia Aigaiou, Kriti	468.312224	9.09	98.29
.	87.9886581	1.71	100.00
Total	5,152	100.00	

PERSON

Variable	Obs	Weight	Mean	Std. Dev.	Min	Max
p weight	5152	3531.52551	.863928	.4557707	.0790357	3.300297
age	5152	3531.52551	44.51394	16.19877	17	74
unemployment	5152	3531.52551	1751.308	16744.86	0	780000

highest completed education level (3-category recode)	Freq.	Percent	Cum.
[1]low	2,949.139	57.24	57.24
[2]medium	1,244.2487	24.15	81.39
[3]high	800.563418	15.54	96.93
.	158.048924	3.07	100.00
Total	5,152	100.00	

male_lfp	Freq.	Percent	Cum.
0	1,410.4425	27.38	27.38
1	3,741.5575	72.62	100.00
Total	5,152	100.00	

Males 2000

HOUSEHOLD

Variable	Obs	Weight	Mean	Std. Dev.	Min	Max
hh weight	4091	10220.0692	3.424609	2.061243	.2189479	16.66578
hh capital	4068	10176.703	325218.5	1135234	-10000	2.20e+07
old age	4067	10175.1487	25953.62	231800	0	5440000
disability	4068	10176.703	43602.35	276383.7	0	4074000
unemployment	4068	10176.703	33119.2	170022.9	0	4725000
family	4068	10176.703	21780.65	104708.3	0	2400000
general	4091	10220.0692	3778.04	43242.2	0	1024200
educational	4068	10176.703	3151.934	114987.6	0	6000000
housing	4091	10220.0692	728.473	12356.84	0	264000
intrahh	4068	10176.703	27685.06	220405	0	5700000
# kids < 5	4091	10220.0692	.147218	.4347742	0	4

Region, NUTS1 classification	Freq.	Percent	Cum.
[1]Voreia Ellada	1,254.58428	30.67	30.67
[2]Kentriki Ellada	857.945393	20.97	51.64
[3]Attiki (incl. greater Athens)	1,533.8143	37.49	89.13
[4]Nisia Aigaiou, Kriti	363.006946	8.87	98.00
.	81.6490324	2.00	100.00
Total	4,091	100.00	

PERSON

Variable	Obs	Weight	Mean	Std. Dev.	Min	Max
p weight	4091	3670.43995	1.229916	.7402757	.078633	5.985355
age	4091	3670.43995	44.61756	16.58409	17	74
unemployment	4091	3670.43995	10603.01	92601.38	0	4250000

highest completed education level (3-category recode)	Freq.	Percent	Cum.
[1]low	2,150.093	52.56	52.56
[2]medium	1,162.6689	28.42	80.98
[3]high	682.4040165	16.68	97.66
.	95.8340477	2.34	100.00
Total	4,091	100.00	

male_lfp	Freq.	Percent	Cum.
0	1,200.4155	29.34	29.34
1	2,890.5845	70.66	100.00
Total	4,091	100.00	

Males 2004

HOUSEHOLD

Variable	Obs	Weight	Mean	Std. Dev.	Min	Max
hh weight	5340	9880.32122	2.588972	1.455508	.1314933	12.25351
hh capital	5340	9880.32122	980.2579	3465.472	0	112500
old age	5340	9880.32122	3781.873	7012.416	0	77760
disability	5340	9880.32122	230.4868	1282.283	0	19040
unemployment	5340	9880.32122	101.6628	562.988	0	10853
family	5340	9880.32122	120.1277	496.921	0	12580
general	5340	9880.32122	41.85754	265.9017	0	3954
educational	5340	9880.32122	29.99979	692.5446	0	24000
intrahh	5340	9880.32122	250.1276	1368.729	0	21000
# kids < 5	5340	9880.32122	.1623349	.4579048	0	5

Region, NUTS1 classification	Freq.	Percent	Cum.
[1]Voreia Ellada	1,732.1847	32.44	32.44
[2]Kentriki Ellada	1,060.6110	19.87	52.13
[3]Attiki (incl. greater Athens)	2,133.7648	38.45	90.76
[4]Nisia Aigaiou, Kriti	493.766384	9.24	100.00
Total	5,340	100.00	

PERSON

Variable	Obs	Weight	Mean	Std. Dev.	Min	Max
p weight	5340	3702.25459	.9701135	.5453934	.0492719	4.591513
age	5340	3702.25459	43.65048	15.85443	17	74
unemployment	5340	3702.25459	64.35612	435.8684	0	14680

highest completed education level (3-category recode)	Freq.	Percent	Cum.
[1]low	2,246.8962	42.08	42.08
[2]medium	1,722.7339	32.26	74.34
[3]high	913.611913	17.11	91.45
.	456.757916	8.55	100.00
Total	5,340	100.00	

male_lfp	Freq.	Percent	Cum.
0	1,486.44932	27.84	27.84
1	3,853.55068	72.16	100.00
Total	5,340	100.00	

Males 2007

HOUSEHOLD

Variable	Obs	Weight	Mean	Std. Dev.	Min	Max
hh weight	6036	9992.23613	2.224575	1.533096	.1691195	19.59684
hh capital	5938	9802.48561	1408.508	5869.203	0	129173
old age	5938	9802.48561	4975.247	9561.761	0	120000
disability	5938	9802.48561	270.3199	1500.294	0	21801
unemployment	5938	9802.48561	194.5509	1019.045	0	30000
family	6036	9992.23613	145.4994	553.3471	0	9524
general	5938	9802.48561	71.97157	450.1306	0	13680
educational	5938	9802.48561	24.32627	445.3735	0	13200
housing	6036	9992.23613	21.86013	201.5719	0	3600
intrahh	5938	9802.48561	322.1089	1791.604	0	30000
# kids < 5	6036	9992.23613	.1515434	.4521815	0	5

region of residence(NUTS 2)	Freq.	Percent	Cum.
[1]Voreia Ellada	1,937.3092	32.09	32.09
[2]Kentriki Ellada	1,232.8419	20.43	52.52
[3]Attiki (incl. greater Athens)	2,133.7648	37.38	89.90
[4]Nisia Aigaiou, Kriti	609.624636	10.11	100.00
Total	6,036	100.00	

PERSON

Variable	Obs	Weight	Mean	Std. Dev.	Min	Max
p weight	6036	3747.12731	.8342243	.574917	.0634205	7.348892
age	6036	3747.12731	43.95928	15.66808	17	74
unemployment	5989	3711.99487	79.06152	715.9699	0	30000

highest completed education level (3-category recode)	Freq.	Percent	Cum.
[1]low	2,314.2459	38.34	38.34
[2]medium	2,425.6271	40.19	78.53
[3]high	1,239.5344	20.54	99.06
.	56.5925353	0.94	100.00
Total	6,036	100.00	

male_lfp	Freq.	Percent	Cum.
0	1,643.6887	27.23	27.23
1	4,392.3113	72.77	100.00
Total	6,036	100.00	

Males 2010

HOUSEHOLD

Variable	Obs	Weight	Mean	Std. Dev.	Min	Max
hh weight	5244	9815.32867	3.133636	2.294356	.0739393	16.47474
hh capital	5096	9462.56274	1325.842	5485.116	0	127127
old age	5096	9462.56274	6034.029	11363.48	0	216255
disability	5095	9460.78687	317.6644	1826.371	0	26940
unemployment	5094	9461.66809	359.7301	1533.327	0	27443
family	5244	9815.32867	220.6243	699.3207	0	8338
general	5096	9462.56274	100.4821	603.3635	0	8259
educational	5096	9462.56274	14.1983	338.7045	0	12000
housing	5244	9815.32867	12.63306	170.385	0	4620
intrahh	5096	9462.56274	288.6985	1439.414	0	20000
# kids < 5	5244	9815.32867	.1413983	.4270059	0	4

region of residence(NUTS 1)	Freq.	Percent	Cum.
[1]Voreia Ellada	1,599.542	30.49	30.49
[2]Kentriki Ellada	1,025.1169	19.55	50.04
[3]Attiki (incl. greater Athens)	2,133.7648	40.50	90.54
[4]Nisia Aigaiou, Kriti	495.640560	9.46	100.00
Total	5,244	100.00	

PERSON

Variable	Obs	Weight	Mean	Std. Dev.	Min	Max
p weight	5244	3710.06017	1.184472	.8672352	.0279481	6.227227
age	5244	3710.06017	44.50737	15.48498	17	74
unemployment	5173	3647.99149	162.1997	1060.198	0	27443

highest completed education level (3-category recode)	Freq.	Percent	Cum.
[1]low	1,669.3496	31.83	31.83
[2]medium	2,213.28305	42.21	74.04
[3]high	1,273.8751	24.29	98.33
.	87.4922429	1.67	100.00
Total	5,244	100.00	

male_lfp	Freq.	Percent	Cum.
0	1,539.2066	29.35	29.35
1	3,704.7934	70.65	100.00
Total	5,244	100.00	

APPENDIX C: PROBIT OUTPUT

Females 1995

MARGINAL EFFECTS AFTER PROBIT

	female b	mfx b	Xmfx_X
fem_lfp			
region2	.168***	.065	.244
region3	−.077	−.029	.288
region4	.121	.047	.120
educ2	.245***	.095	.266
educ3	1.038***	.392	.092
age_25	1.486***	.520	.097
age_30	1.665***	.557	.087
age_35	1.330***	.479	.090
age_40	1.399***	.497	.090
age_45	1.225***	.449	.085
age_50	.998***	.379	.089
age_55	.947***	.361	.071
age_60	.455***	.179	.086
age_65	.012	.004	.080
hh capital	−.000***	−.000	214846
old age	−.000	−.000	7434.455
disability	.000	.000	37393.50
unemployment	.000	.000	2989.821
family	.000	.000	22594.22
general	.000	.000	9368.387
educational	−.000	−.000	1493.251
intrahh	−.000***	−.000	45696.64
# kids < 5	−.434***	−.166	.169
_cons	−1.217***		

Females 2000

MARGINAL EFFECTS AFTER PROBIT

	female b	mfx b	Xmfx_X
female_lfp			
region2	.147**	.057	.269
region3	−.097	−.037	.229
region4	.232***	.091	.125
educ2	.350***	.137	.309
educ3	1.064***	.399	.110
age_25	1.501***	.514	.091
age_30	1.693***	.555	.094
age_35	1.570***	.527	.084
age_40	1.474***	.508	.090
age_45	1.587***	.531	.085
age_50	1.361***	.480	.084
age_55	1.016***	.382	.082
age_60	.767***	.297	.071
age_65	.276**	.109	.083
hh capital	−.000***	−.000	301800.6
old age	.000***	.000	24603.3
disability	−.000	−.000	38785.21
unemployment	.000*	.000	19837.36
family	−.000	−.000	30339.77
general	.000	.000	5604.222
educational	.000	.000	1867.411
intrahh	−.000	−.000	35908.35
# kids < 5	−.323	−.125	.175
_cons	−1.387***		

legend: * p<0.05
** p<0.01
*** p<0.001

Females 2004

MARGINAL EFFECTS AFTER PROBIT

	female b	mfx b	Xmfx_X
female_lfp			
region2	.017	.006	.230
region3	−.074	−.029	.280
region4	.112	.044	.104
educ2	.509***	.200	.282
educ3	1.265***	.449	.147
age_25	1.460***	.481	.087
age_30	1.837***	.546	.087
age_35	1.658***	.519	.089
age_40	1.538***	.500	.096
age_45	1.374***	.466	.098
age_50	1.353***	.460	.094
age_55	1.042***	.378	.082
age_60	.827***	.311	.079
age_65	.485***	.190	.070
hh capital	−.000***	−.000	1035.673
old age	−.000***	−.000	3853.244
disability	−.000***	−.000	208.204
unemplyment	.000	.000	105.701
family	.000	.000	198.045
general	−.000***	−.000	63.391
educational	−.000	−.000	12.021
intrahh	−.000***	−.000	273.149
# kids < 5	−.382***	−.151	.176
_cons	−1.186***		

Females 2007

MARGINAL EFFECTS AFTER PROBIT

	female b	mfx b	Xmfx_X
female_lfp			
region2	.067	.027	.214
region3	−.067	−.026	.322
region4	.160	.063	.110
educ2	.221	.088	.357
educ3	1.021	.378	.186
age_25	1.550	.483	.070
age_30	2.149	.565	.082
age_35	2.044	.561	.091
age_40	1.864	.544	.100
age_45	1.788	.533	.098
age_50	1.739	.522	.091
age_55	1.467	.474	.089
age_60	1.120	.394	.087
age_65	.817	.305	.078
hh campital	−.000	−.000	1447.228
old age	−.000	−.000	5403.2
diability	−.000	−.000	251.859
unemplyment	.000	.000	187.279
family	.000	.000	201.956
general	−.000	−.000	112.660
educational	−.000	−.000	18.678
intrahh	−.000	−.000	409.180
# kids < 5	−.411	−.163	.158
_cons	−1.399		

legend: * p<0.05
** p<0.01
*** p<0.001

Females 2010

MARGINAL EFFECTS AFTER PROBIT

	female b	mfx b	Xmfx_X
female_lfp			
region2	.002	.001	.254
region3	−.054	−.021	.243
region4	.065	.025	.114
educ2	.206***	.082	.366
educ3	.870***	.329	.194
age_25	1.694***	.502	.063
age_30	2.290***	.570	.073
age_35	2.434***	.583	.078
age_40	2.146***	.570	.090
age_45	2.122***	.572	.097
age_50	2.005***	.563	.102
age_55	1.725***	.525	.103
age_60	1.248***	.426	.086
age_65	.836***	.312	.099
hh capital	−.000*	−.000	1198.606
old age	−.000***	−.000	6111.449
disability	−.000**	−.000	317.651
unemployment	.000***	.000	352.326
family	−.000	−.000	337.558
general	−.000	−.000	157.371
educational	−.000	−.000	14.730
intrahh	−.000***	−.000	305.500
# kids < 5	−.301***	−.120	.136
_cons	−1.541***		

Males 1995

MARGINAL EFFECTS AFTER PROBIT

	male b	mfx b	Xmfx_X
male_lfp			
region2	.131*	.031	.251
region3	−.134*	−.034	.275
region4	.035	.008	.118
educ2	−.216**	−.056	.237
educ3	.187*	.043	.137
age_25	1.817***	.208	.097
age_30	2.775***	.241	.098
age_35	2.791***	.233	.088
age_40	2.674***	.231	.089
age_45	2.770***	.231	.087
age_50	2.426***	.225	.091
age_55	2.126***	.207	.076
age_60	1.394***	.181	.078
age_65	.414***	.086	.092
hh capital	−.000**	−.000	220737.4
old age	−.000*	−.000	8746.997
disability	−.000***	−.000	39917.86
unemployment	.000	.000	3563.674
family	−.000	−.000	24920.07
general	−.000	−.000	8036.976
education	−.000	−.000	1411.491
intrahh	−.000***	−.000	29726.9
# kids < 5	.174*	.043	.174
_cons	−.657		

legend: * p<0.05
** p<0.01
*** p<0.001

Males 2000

MARGINAL EFFECTS AFTER PROBIT

	male	mfx	
	b	b	Xmfx_X
male_lfp			
region2	.040	.010	.234
region3	−.147*	−.038	.272
region4	−.031	−.007	.105
educ2	.740***	.159	.299
educ3	.985***	.172	.153
age_25	1.487***	.193	.089
age_30	2.500***	.228	.088
age_35	2.816***	.246	.098
age_40	2.668***	.239	.096
age_45	2.287***	.223	.090
age_50	2.226***	.221	.090
age_55	1.790***	.206	.090
age_60	1.341***	.182	.082
age_65	.798	.137	.068
hh capital	−.000**	−.000	935.126
old age	−.000***	−.000	3930.385
disability	−.000***	.000	263.558
unemployment	.000	.000	102.545
family	.000***	.000	197.985
general	−.000**	−.000	46.950
educational	−.000**	−.000	22.965
intrahh	−.000***	−.000	238.271
# kids < 5	.055	.013	.178
_cons	−.549***		

Males 2004

MARGINAL EFFECTS AFTER PROBIT

	male	mfx	
	b	b	Xmfx_X
male_lfp			
region2	.040	.010	.234
region3	−.147*	−.038	.272
region4	−.031	−.007	.105
educ2	.740***	.159	.299
educ3	.985***	.172	.153
age_25	1.487***	.193	.089
age_30	2.500***	.228	.088
age_35	2.816***	.246	.098
age_40	2.668***	.239	.096
age_45	2.287***	.223	.090
age_50	2.226***	.221	.090
age_55	1.790***	.206	.090
age_60	1.341***	.182	.082
age_65	.798	.137	.068
hh capital	−.000**	−.000	935.126
old age	−.000***	−.000	3930.385
disability	−.000***	.000	263.558
unemployment	.000	.000	102.545
family	.000***	.000	197.985
general	−.000**	−.000	46.950
educational	−.000**	−.000	22.965
intrahh	−.000***	−.000	238.271
# kids < 5	.055	.013	.178
_cons	−.549***		

legend: * p<0.05
** p<0.01
*** p<0.001

Males 2007

MARGINAL EFFECTS AFTER PROBIT

	male b	mfx b	Xmfx_X
male_lfp			
region2	−.000	−.000	.223
region3	−.130*	−.036	.316
region4	−.016	−.004	.113
educ2	.053	.014	.395
educ3	.637***	.143	.196
age_25	1.391***	.206	.079
age_30	2.467***	.261	.098
age_35	2.661***	.261	.090
age_40	2.780***	.267	.093
age_45	2.604***	.265	.096
age_50	2.490***	.257	.091
age_55	2.142***	.243	.088
age_60	1.450***	.212	.086
age_65	.893***	.165	.077
hh capital	−.000	−.000	1381.635
old age	−.000***	−.000	5332.641
disability	−.000***	−.000	288.768
unemployment	−.000	−.000	190.292
family	.000	.000	203.056
general	−.000***	−.000	80.634
educational	−.000*	−.000	22.953
intrahh	−.000***	−.000	317.556
# kids < 5	.208*	.056	.159
_cons	−.590***		

Males 2010

MARGINAL EFFECTS AFTER PROBIT

	male b	mfx b	Xmfx_X
male_lfp			
region2	.151*	.041	.266
region3	−.212**	−.062	.244
region4	.001	.000	.111
educ2	.273***	.074	.400
educ3	.976***	.206	.198
age_25	1.385***	.214	.075
age_30	2.699***	.264	.078
age_35	3.079***	.278	.082
age_40	2.988***	.283	.089
age_45	2.817***	.287	.099
age_50	2.664***	.284	.101
age_55	2.095***	.259	.096
age_60	1.571***	.230	.088
age_65	1.018***	.189	.092
hh capital	−.000**	−.000	1221.223
old age	−.000***	−.000	5918.015
disability	−.000***	−.000	352.227
unemployment	.000*	.000	377.558
family	.000	.000	359.981
general	−.000	−.000	112.553
educational	−.000	−.000	11.270
intrahh	−.000***	−.000	283.986
# kids < 5	.204	.057	.141
_cons	−.813***		

legend: * p<0.05
** p<0.01
*** p<0.001

APPENDIX D: TOBIT OUTPUT

Females 1995

MARGINAL EFFECTS AFTER TOBIT

	female	mfx	
	b	b	Xmfx_X
wkly hrs			
region2	−.720	−.720	.259
region3	.399	.399	.289
region4	.222	.222	.113
educ2	1.011	1.011	.315
educ3	−4.418***	−4.418	.203
age_25	2.605	2.605	.110
age_30	3.863*	3.863	.142
age_35	2.269	2.269	.133
age_40	4.565**	4.565	.153
age_45	3.710*	3.710	.124
age_50	3.755*	3.755	.116
age_55	.866	.866	.090
age_60	1.731	1.731	.059
age_65	.038	.038	.028
hh capital	.000	.000	203319.6
old age	−.000	−.000	3993.701
disability	.000	.000	24032.19
unemployment	.000	.000	2947.431
family	−.000	−.000	20333.76
general	.000	.000	11016.66
educational	−.000	−.000	1985.319
intrahh	.000	.000	37882.55
# kids < 5	−1.249*	−1.249	.177
_cons	36.062***		
sigma			
_cons	11.410***		

Females 2000

MARGINAL EFFECTS AFTER TOBIT

	female	mfx	
	b	b	Xmfx_X
wkly hrs			
region2	.193	.193	.266
region3	.831	.831	.244
region4	2.415**	2.415	.146
educ2	.795	.795	.366
educ3	−4.446***	−4.446	.217
age_25	5.465**	5.465	.117
age_30	6.768***	6.768	.144
age_35	5.053**	5.053	.129
age_40	5.243**	5.243	.139
age_45	5.474***	5.474	.143
age_50	5.624***	5.624	.115
age_55	4.555*	4.555	.080
age_60	−.043	−.043	.056
age_65	−1.579	−1.579	.033
hh capital	.000	.000	247642.9
old age	.000	.000	27044.81
disability	−.000	−.000	28638.67
unemployment	−.000	−.000	26432.01
family	.000	.000	24418.05
general	.000	.000	6438.828
educational	.000	.000	4532.65
intrahh	−.000	−.000	32858.51
# kids < 5	.052	.052	.202
_cons	33.829***		
sigma			
_cons	11.366***		

legend: * p<0.05
** p<0.01
*** p<0.001

Females 2004

MARGINAL EFFECTS AFTER TOBIT

	female b	mfx b	Xmfx_X
wkly hours			
region2	−.326	−.326	.211
region3	1.788**	1.788	.296
region4	.845	.845	.110
educ2	.488	.488	.362
educ3	−3.155***	−3.155	.274
age_25	2.343	2.343	.096
age_30	2.590	2.590	.129
age_35	3.365	3.365	.136
age_40	1.953	1.953	.153
age_45	3.426*	3.426	.148
age_50	2.048	2.048	.134
age_55	2.659	2.659	.083
age_60	3.410	3.410	.060
age_65	−3.259	−3.259	.028
hh capital	.000	.000	992.922
old age	−.000	−.000	1883.76
disability	−.000	−.000	141.886
unemployment	−.000	−.000	108.234
family	−.000	−.000	204.079
general	.000	.000	22.193
educational	−.000	−.000	9.449
intrahh	−.000	−.000	223.105
# kids < 5	−1.916***	−1.916	.214
_cons	36.135***		
sigma			
_cons	12.384***		

Females 2007

MARGINAL EFFECTS AFTER TOBIT

	female b	mfx b	Xmfx_X
wkly hours			
region2	.233	.233	.198
region3	1.808**	1.808	.342
region4	3.660***	3.660	.122
educ2	−.704	−.704	.379
educ3	−4.135***	−4.135	.332
age_25	5.044*	5.044	.065
age_30	5.384**	5.384	.130
age_35	5.987**	5.987	.144
age_40	5.974**	5.974	.153
age_45	5.162**	5.162	.151
age_50	7.747***	7.747	.128
age_55	4.012*	4.012	.106
age_60	2.207	2.207	.063
age_65	5.635*	5.635	.036
hh capital	.000	.000	1491.485
old age	−.000	−.000	2813.042
disability	−.000	−.000	171.541
unemployment	.000	.000	215.224
family	−.000	−.000	214.615
general	−.000	−.000	66.350
educational	.000	.000	23.068
intrahh	.000	.000	258.546
# kids < 5	−1.364*	−1.364	.193
_cons	34.005***		
sigma			
_cons	12.312***		

legend: * p<0.05
** p<0.01
*** p<0.001

Females 2010

MARGINAL EFFECTS AFTER TOBIT

	female b	mfx b	Xmfx_X
model			
region2	−.691	−.691	.239
region3	.568	.568	.257
region4	1.782*	1.782	.120
educ2	.093	.093	.361
educ3	−2.738***	−2.738	.343
age_25	2.086	2.086	.048
age_30	4.448	4.448	.099
age_35	5.964*	5.964	.128
age_40	4.401	4.401	.135
age_45	4.065	4.065	.164
age_50	4.446	4.446	.175
age_55	3.730	3.730	.129
age_60	4.268	4.268	.066
age_65	3.261	3.261	.044
hh capital	.000	.000	1334.766
old age	.000	.000	2974.238
disability	.000	.000	213.794
unemployment	−.000	−.000	262.931
family	−.000	−.000	375.034
general	.000	.000	82.419
educational	.000	.000	21.700
intrahh	−.000	−.000	213.643
# kids < 5	−.680	−.680	.182
_cons	33.254***		
sigma			
_cons	11.256***		

Males 1995

MARGINAL EFFECTS AFTER TOBIT

	male b	mfx b	Xmfx_X
wkly hrs			
region2	−.970	−.970	.257
region3	−1.053	−1.053	.270
region4	.783	.783	.118
educ2	−.536	−.536	.250
educ3	−4.001***	−4.001	.175
age_25	3.677**	3.677	.085
age_30	4.535***	4.535	.126
age_35	6.316***	6.316	.124
age_40	6.059***	6.059	.130
age_45	6.334***	6.334	.124
age_50	7.552***	7.552	.124
age_55	6.275***	6.275	.104
age_60	6.073***	6.073	.087
age_65	5.826***	5.826	.050
hh capital	.000***	.000	200917.2
old age	−.000**	−.000	5265.328
disability	−.000	−.000	14168.24
unemployment	−.000	−.000	3323.076
family	−.000	−.000	22982.65
general	.000	.000	4601.863
educational	.000	.000	1139.89
intrahh	−.000	−.000	23572.08
# kids < 5	1.377**	1.377	.2336591
_cons	41.194***		
sigma			
_cons	12.796***		

legend: * p<0.05
** p<0.01
*** p<0.001

Males 2000

MARGINAL EFFECTS AFTER TOBIT

	male b	mfx b	Xmfx_X
wkly hrs			
region2	−2.310***	−2.310	.271
region3	−1.043	−1.043	.232
region4	2.349**	2.349	.132
educ2	−1.502**	−1.502	.305
educ3	−5.320***	−5.320	.182
age_25	3.902**	3.902	.090
age_30	5.977***	5.977	.131
age_35	6.071***	6.071	.134
age_40	6.766***	6.766	.123
age_45	5.271***	5.271	.135
age_50	7.646***	7.646	.120
age_55	6.430***	6.430	.113
age_60	5.929***	5.929	.074
age_65	3.697	3.697	.040
hh capital	.000	.000	261735.3
old age	.000	.000	15568.48
disability	−.000	−.000	24784.54
unemployment	.000	.000	30793.61
family	.000	.000	29092.61
general	.000	.000	6863.409
educational	−.000	−.000	2745.218
intrahh	−.000	−.000	23454.48
# kids < 5	1.139	1.139	.248
_cons	41.894		
sigma			
_cons	11.793		

Males 2004

MARGINAL EFFECTS AFTER TOBIT

	male b	mfx b	Xmfx_X
wkly hrs			
region2	−.694	−.694	.233
region3	−2.518***	−2.518	.268
region4	.414	.414	.112
educ2	−1.265*	−1.265	.363
educ3	−5.222***	−5.222	.196
age_25	4.319**	4.319	.078
age_30	6.074***	6.074	.111
age_35	6.993***	6.993	.145
age_40	7.415***	7.416	.141
age_45	7.739***	7.739	.129
age_50	6.487***	6.487	.129
age_55	7.369***	7.369	.113
age_60	8.306***	8.306	.080
age_65	6.574***	6.574	.036
hh capital	.000	.000	847.851
old age	−.000	−.000	1587.123
disability	−.000*	−.000	135.759
unemployment	−.001*	−.001	108.068
family	.000	.000	225.766
general	.001	.001	27.360
educational	.000	.000	12.377
intrahh	−.000	−.000	155.350
# kids < 5	.592	.592	.250
_cons	41.683***		
sigma			
_cons	12.123***		

legend: * p<0.05
** p<0.01
*** p<0.001

Males 2007

MARGINAL EFFECTS AFTER TOBIT

	female b	mfx b	Xmfx_X
wkly hours			
region2	.233	.233	.198
region3	1.808**	1.808	.342
region4	3.660***	3.660	.122
educ2	−.704	−.704	.379
educ3	−4.135***	−4.135	.332
age_25	5.044*	5.044	.065
age_30	5.384**	5.384	.130
age_35	5.987**	5.987	.144
age_40	5.974**	5.974	.153
age_45	5.162**	5.162	.151
age_50	7.747***	7.747	.128
age_55	4.012*	4.012	.106
age_60	2.207	2.207	.063
age_65	5.635*	5.635	.036
hh capital	.000	.000	1491.485
old age	−.000	−.000	2813.042
disability	−.000	−.000	171.541
unemployment	.000	.000	215.224
family	−.000	−.000	214.615
general	−.000	−.000	66.350
educational	.000	.000	23.068
intrahh	.000	.000	258.546
# kids < 5	−1.364*	−1.364	.193
_cons	34.005***		
sigma			
_cons	12.312***		

Males 2010

MARGINAL EFFECTS AFTER TOBIT

	male b	mfx b	Xmfx_X
wkly hrs			
region2	−.633	−.633	.268
region3	−1.378*	−1.378	.235
region4	−.676	−.676	.113
educ2	−.888	−.889	.420
educ3	−3.038***	−3.038	.265
age_25	−1.154	−1.154	.042
age_30	1.078	1.078	.091
age_35	2.864	2.864	.121
age_40	3.127	3.127	.137
age_45	4.264*	4.265	.155
age_50	3.985*	3.985	.162
age_55	2.761	2.761	.133
age_60	4.518*	4.518	.088
age_65	4.560*	4.560	.056
hh capital	.000*	.000	1289.872
old age	−.000	−.000	2349.125
disability	.000	.000	133.384
unemployment	.000	.000	251.188
family	.000	.000	379.020
general	.001	.001	65.646
educational	−.001	−.001	11.233
intrahh	.000	.000	146.051
# kids < 5	1.287**	1.287	.220
_cons	41.462***		
sigma			
_cons	10.798***		

---

legend: * p<0.05
** p<0.01
*** p<0.001

APPENDIX E: OLS OUTPUT

Females 1995

```
Heckman selection model                         Number of obs      =      5483
(regression model with sample selection)        Censored obs       =      4562
                                                Uncensored obs     =       921

                                                Wald chi2(3)       =    550.29
Log likelihood = -9236.037                      Prob > chi2        =    0.0000

------------------------------------------------------------------------------
        net1 |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
net1         |
       educ2 |   750.3541   63.19488    11.87   0.000     626.4944    874.2138
       educ3 |   1858.997   79.35389    23.43   0.000     1703.467    2014.528
         age |   2.405337   2.392836     1.01   0.315    -2.284535     7.09521
       _cons |  -1079.244   109.2461    -9.88   0.000    -1293.363   -865.1258
-------------+----------------------------------------------------------------
select       |
     married |          0  (omitted)
     nhhmem5 |  -.1214799   .0306975    -3.96   0.000     -.181646   -.0613138
       educ2 |    .503052   .0502017    10.02   0.000     .4046585    .6014455
       educ3 |   1.475109   .0636972    23.16   0.000     1.350265    1.599953
         age |  -.0147378   .0015518    -9.50   0.000    -.0177793   -.0116963
       _cons |   -.709749   .0760143    -9.34   0.000    -.8587344   -.5607637
-------------+----------------------------------------------------------------
     /athrho |   1.954864   .0745862    26.21   0.000     1.808678    2.10105
    /lnsigma |    6.98701   .0341883   204.37   0.000     6.920002    7.054018
-------------+----------------------------------------------------------------
         rho |    .960696   .0057479                      .9476973     .970513
       sigma |    1082.48   37.00818                      1012.322     1157.5
      lambda |   1039.934   40.11157                      961.3171    1118.552
------------------------------------------------------------------------------
LR test of indep. eqns. (rho = 0):   chi2(1) =   286.15   Prob > chi2 = 0.0000
```

Females 2000

```
Heckman selection model                         Number of obs      =      4321
(regression model with sample selection)        Censored obs       =      4031
                                                Uncensored obs     =       290

                                                Wald chi2(3)       =    144.37
Log likelihood = -3271.307                      Prob > chi2        =    0.0000

------------------------------------------------------------------------------
      gross1 |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
gross1       |
       educ2 |   792.7158    137.641     5.76   0.000     522.9443    1062.487
       educ3 |   1902.822    161.666    11.77   0.000     1585.962    2219.681
         age |   .8371374   5.292475     0.16   0.874    -9.535924     11.2102
       _cons |  -1936.038   260.6426    -7.43   0.000    -2446.888   -1425.187
-------------+----------------------------------------------------------------
select       |
     married |          0  (omitted)
     nhhmem5 |  -.0777784   .0379299    -2.05   0.040    -.1521197   -.0034372
       educ2 |   .3208653   .0755422     4.25   0.000     .1728054    .4689251
       educ3 |   .7698524   .0872776     8.82   0.000     .5987913    .9409134
         age |  -.0120593   .0022828    -5.28   0.000    -.0165335   -.0075852
       _cons |  -1.235578   .1179279   -10.48   0.000    -1.466713   -1.004444
-------------+----------------------------------------------------------------
     /athrho |    2.31886   .1479861    15.67   0.000     2.028812    2.608907
    /lnsigma |   7.356759    .067251   109.39   0.000     7.224949    7.488569
-------------+----------------------------------------------------------------
         rho |   .9808261   .0056205                      .9660077    .9892201
       sigma |    1566.75   105.3655                      1373.269    1787.491
      lambda |    1536.71   109.9457                       1321.22    1752.199
------------------------------------------------------------------------------
LR test of indep. eqns. (rho = 0):   chi2(1) =    78.48   Prob > chi2 = 0.0000
```

Females 2004

```
Heckman selection model                         Number of obs      =      5648
(regression model with sample selection)        Censored obs       =      4249
                                                Uncensored obs     =      1399

                                                Wald chi2(3)       =    606.36
Log likelihood = -6215.399                      Prob > chi2        =    0.0000

------------------------------------------------------------------------------
      gross1 |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
gross1       |
       educ2 |   .7908644   .3455793     2.29   0.022     .1135413    1.468187
       educ3 |   3.924961   .4567178     8.59   0.000     3.029811    4.820111
         age |   .1580185   .0107587    14.69   0.000     .1369317    .1791052
       _cons |   1.044242   .6205548     1.68   0.092    -.1720231    2.260507
-------------+----------------------------------------------------------------
select       |
     married |          0  (omitted)
     nhhmem5 |  -.0539232   .0380089    -1.42   0.156    -.1284192    .0205729
       educ2 |   .7537567   .0462718    16.29   0.000     .6630656    .8444477
       educ3 |   1.382687   .0563203    24.55   0.000     1.272302    1.493073
         age |  -.0211273   .0014484   -14.59   0.000     -.023966   -.0182885
       _cons |  -.2917475   .0715504    -4.08   0.000    -.4319836   -.1515113
-------------+----------------------------------------------------------------
     /athrho |  -.4959701   .1286931    -3.85   0.000    -.7482039   -.2437364
    /lnsigma |   1.274115   .0426886    29.85   0.000     1.190447    1.357783
-------------+----------------------------------------------------------------
         rho |   -.458942   .1015867                     -.6340762   -.2390218
       sigma |   3.575535   .1526347                      3.288549    3.887565
      lambda |  -1.640963   .4271667                     -2.478194   -.8037316
------------------------------------------------------------------------------
LR test of indep. eqns. (rho = 0):   chi2(1) =     6.66   Prob > chi2 = 0.0099
```

Females 2007

```
Heckman selection model                         Number of obs      =      6337
(regression model with sample selection)        Censored obs       =      5805
                                                Uncensored obs     =       532

                                                Wald chi2(3)       =    272.90
Log likelihood = -3140.308                      Prob > chi2        =    0.0000

------------------------------------------------------------------------------
      gross1 |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
gross1       |
       educ2 |   6.861659   .8777092     7.82   0.000     5.141381    8.581938
       educ3 |   14.99385   .9521265    15.75   0.000     13.12772    16.85998
         age |  -.0164716   .0261181    -0.63   0.528    -.0676621    .0347188
       _cons |  -19.73647    1.56266   -12.63   0.000    -22.79923   -16.67371
-------------+----------------------------------------------------------------
select       |
     married |          0  (omitted)
     nhhmem5 |  -.0408036   .0165224    -2.47   0.014    -.0731869   -.0084202
       educ2 |   .4898276   .0657394     7.45   0.000     .3609807    .6186744
       educ3 |   1.056766    .066724    15.84   0.000     .9259899    1.187543
         age |  -.0069595   .0018206    -3.82   0.000    -.0105278   -.0033912
       _cons |  -1.598797   .1035596   -15.44   0.000     -1.80177   -1.395824
-------------+----------------------------------------------------------------
     /athrho |   3.674051   .1559001    23.57   0.000     3.368492     3.97961
    /lnsigma |   2.540483   .0368488    68.94   0.000     2.468261    2.612705
-------------+----------------------------------------------------------------
         rho |   .9987132    .000401                      .9976304    .9993014
       sigma |    12.6858   .4674569                       11.8019    13.63589
      lambda |   12.66947   .4687763                      11.75069    13.58826
------------------------------------------------------------------------------
LR test of indep. eqns. (rho = 0):   chi2(1) =   755.71   Prob > chi2 = 0.0000
```

Females 2010

```
Heckman selection model                         Number of obs      =      5481
(regression model with sample selection)        Censored obs       =      4830
                                                Uncensored obs     =       651

                                                Wald chi2(3)       =    294.34
Log likelihood = -3495.209                      Prob > chi2        =    0.0000

------------------------------------------------------------------------------
      wages  |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
wages        |
       educ2 |   1.220264   .5219802     2.34   0.019     .1972018    2.243326
       educ3 |   4.492617   .7304374     6.15   0.000     3.060986    5.924248
         age |   .1799821   .0163125    11.03   0.000     .1480101    .2119541
       _cons |   1.035773   1.416049     0.73   0.465    -1.739631    3.811178
-------------+----------------------------------------------------------------
select       |
     married |          0  (omitted)
     nhhmem5 |   .1417375   .0464786     3.05   0.002     .0506411    .2328339
       educ2 |   .4849503   .0632656     7.67   0.000     .3609521    .6089485
       educ3 |    1.05612   .0649683    16.26   0.000     .9287843    1.183455
         age |  -.0100122   .0017911    -5.59   0.000    -.0135227   -.0065016
       _cons |  -1.250859   .1031924   -12.12   0.000    -1.453112   -1.048605
-------------+----------------------------------------------------------------
     /athrho |  -.4397372   .2076082    -2.12   0.034    -.8466418   -.0328327
    /lnsigma |   1.293934   .0716371    18.06   0.000     1.153528     1.43434
-------------+----------------------------------------------------------------
         rho |  -.4134266   .1721235                      -.689311   -.0328209
       sigma |   3.647106    .261268                      3.169354    4.196874
      lambda |  -1.507811    .728568                     -2.935778   -.0798435
------------------------------------------------------------------------------
LR test of indep. eqns. (rho = 0):   chi2(1) =     2.41   Prob > chi2 = 0.1205
```

Males 1995

```
Heckman selection model                         Number of obs      =      5152
(regression model with sample selection)        Censored obs       =      3395
                                                Uncensored obs     =      1757

                                                Wald chi2(3)       =    439.02
Log likelihood = -17063.88                      Prob > chi2        =    0.0000

------------------------------------------------------------------------------
        net1 |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
net1         |
       educ2 |   346.0469   42.50109     8.14   0.000     262.7463    429.3475
       educ3 |   668.3656   57.34855    11.65   0.000     555.9645    780.7667
         age |   22.75837   1.701864    13.37   0.000     19.42278    26.09396
       _cons |   318.7702   89.87442     3.55   0.000     142.6195    494.9208
-------------+----------------------------------------------------------------
select       |
     married |          0  (omitted)
     nhhmem5 |   .2290639   .0377689     6.06   0.000     .1550382    .3030895
       educ2 |   .2680412   .0449226     5.97   0.000     .1799945     .356088
       educ3 |   .8060205   .0539715    14.93   0.000     .7002382    .9118028
         age |  -.0119229   .0012253    -9.73   0.000    -.0143245   -.0095213
       _cons |  -.1319358    .060449    -2.18   0.029    -.2504136    -.013458
-------------+----------------------------------------------------------------
     /athrho |  -.2868823   .1089644    -2.63   0.008    -.5004486    -.073316
    /lnsigma |   6.561997   .0268259   244.61   0.000      6.50942    6.614575
-------------+----------------------------------------------------------------
         rho |  -.2792628   .1004665                     -.4624699   -.0731849
       sigma |   707.6838   18.98424                      671.4366    745.8878
      lambda |  -197.6297   75.29631                     -345.2078   -50.05168
------------------------------------------------------------------------------
LR test of indep. eqns. (rho = 0):   chi2(1) =     4.57   Prob > chi2 = 0.0325
```

Males 2000

```
Heckman selection model                         Number of obs      =      4091
(regression model with sample selection)        Censored obs       =      3662
                                                Uncensored obs     =       429

                                                Wald chi2(3)       =    346.25
Log likelihood = -4770.818                      Prob > chi2        =    0.0000

------------------------------------------------------------------------------
      gross1 |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
gross1       |
       educ2 |   374.0508   114.6855     3.26   0.001     149.2714    598.8302
       educ3 |   1176.945   123.5512     9.53   0.000     934.7893    1419.101
         age |     44.141   3.966366    11.13   0.000     36.36706    51.91493
       _cons |   14.46967   466.5458     0.03   0.975    -899.9433    928.8827
-------------+----------------------------------------------------------------
select       |
     married |          0  (omitted)
     nhhmem5 |   .0246859   .0555373     0.44   0.657    -.0841652     .133537
       educ2 |    .338367    .062714     5.40   0.000     .2154498    .4612842
       educ3 |   .3102724   .0762076     4.07   0.000     .1609083    .4596365
         age |   -.009093   .0018325    -4.96   0.000    -.0126847   -.0055014
       _cons |  -1.038262   .0917896   -11.31   0.000    -1.218167   -.8583578
-------------+----------------------------------------------------------------
     /athrho |  -.1169351   .3862634    -0.30   0.762    -.8739975    .6401272
    /lnsigma |   6.608417   .0504392   131.02   0.000     6.509558    6.707276
-------------+----------------------------------------------------------------
         rho |   -.116405   .3810295                     -.7033994    .5649862
       sigma |   741.3087   37.39099                      671.5297    818.3385
      lambda |  -86.29207   285.6798                     -646.2142    473.6301
------------------------------------------------------------------------------
LR test of indep. eqns. (rho = 0):   chi2(1) =     0.07   Prob > chi2 = 0.7978
```

Males 2004

```
Heckman selection model                         Number of obs      =      5340
(regression model with sample selection)        Censored obs       =      3434
                                                Uncensored obs     =      1906

                                                Wald chi2(3)       =    899.71
Log likelihood = -8146.904                      Prob > chi2        =    0.0000

------------------------------------------------------------------------------
      gross1 |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
gross1       |
       educ2 |   .7852239   .2226791     3.53   0.000     .3487808    1.221667
       educ3 |   3.918752   .2735171    14.33   0.000     3.382668    4.454835
         age |   .1535323   .0084318    18.21   0.000     .1370064    .1700583
       _cons |   1.143674   .3915396     2.92   0.003     .3762709    1.911078
-------------+----------------------------------------------------------------
select       |
     married |          0  (omitted)
     nhhmem5 |   .1514005   .0350578     4.32   0.000     .0826884    .2201126
       educ2 |   .5759267   .0418502    13.76   0.000     .4939018    .6579516
       educ3 |    .862252   .0523621    16.47   0.000     .7596242    .9648799
         age |   -.018996   .0012387   -15.34   0.000    -.0214237   -.0165683
       _cons |   .0947998   .0613651     1.54   0.122    -.0254736    .2150731
-------------+----------------------------------------------------------------
     /athrho |  -.2439454   .0907917    -2.69   0.007     -.421894   -.0659969
    /lnsigma |   1.248238   .0218674    57.08   0.000     1.205378    1.291097
-------------+----------------------------------------------------------------
         rho |  -.2392189   .0855961                     -.3985248   -.0659013
       sigma |   3.484197   .0761902                      3.338022    3.636774
      lambda |  -.8334859   .3107839                     -1.442611   -.2243606
------------------------------------------------------------------------------
LR test of indep. eqns. (rho = 0):   chi2(1) =     4.90   Prob > chi2 = 0.0269
```

Males 2007

```
Heckman selection model                         Number of obs      =      6036
(regression model with sample selection)        Censored obs       =      5356
                                                Uncensored obs     =       680

                                                Wald chi2(3)       =     44.38
Log likelihood = -4529.111                      Prob > chi2        =    0.0000

------------------------------------------------------------------------------
      gross1 |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
gross1       |
       educ2 |   .0787639   1.098957     0.07   0.943    -2.075152     2.23268
       educ3 |   3.071822   1.297145     2.37   0.018     .5294647    5.614178
         age |   .1707615   .0356464     4.79   0.000     .1008958    .2406273
       _cons |   2.937878   2.765884     1.06   0.288    -2.483156    8.358911
-------------+----------------------------------------------------------------
select       |
     married |          0  (omitted)
     nhhmem5 |   .1112504   .0423864     2.62   0.009     .0281747    .1943261
       educ2 |    .384194   .0555266     6.92   0.000     .2753638    .4930242
       educ3 |   .7292124   .0591617    12.33   0.000     .6132575    .8451673
         age |  -.0070144   .0015532    -4.52   0.000    -.0100587   -.0039701
       _cons |  -1.273398   .0864941   -14.72   0.000    -1.442924   -1.103873
-------------+----------------------------------------------------------------
     /athrho |  -.0596259   .1295988    -0.46   0.645     -.313635    .1943831
    /lnsigma |    2.27938   .0278983    81.70   0.000     2.224701     2.33406
-------------+----------------------------------------------------------------
         rho |  -.0595554   .1291392                     -.3037404    .1919713
       sigma |   9.770624   .2725841                      9.250713    10.31976
      lambda |  -.5818932   1.265691                     -3.062601    1.898815
------------------------------------------------------------------------------
LR test of indep. eqns. (rho = 0):   chi2(1) =     0.17   Prob > chi2 = 0.6788
```

Males 2010

```
Heckman selection model                         Number of obs      =      5244
(regression model with sample selection)        Censored obs       =      4462
                                                Uncensored obs     =       782

                                                Wald chi2(3)       =    296.50
Log likelihood = -4268.173                      Prob > chi2        =    0.0000

------------------------------------------------------------------------------
      gross1 |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
gross1       |
       educ2 |   1.508746   .4647532     3.25   0.001     .5978462    2.419645
       educ3 |   4.389604   .5266591     8.33   0.000     3.357371    5.421837
         age |   .1868936   .0152288    12.27   0.000     .1570456    .2167416
       _cons |   .7936105   1.083832     0.73   0.464    -1.330662    2.917883
-------------+----------------------------------------------------------------
select       |
     married |          0  (omitted)
     nhhmem5 |    .294753   .0433103     6.81   0.000     .2098663    .3796396
       educ2 |   .5420835   .0548963     9.87   0.000     .4344888    .6496783
       educ3 |   .7187929   .0609363    11.80   0.000     .5993599    .8382259
         age |  -.0069449   .0015591    -4.45   0.000    -.0100007   -.0038891
       _cons |  -1.194747   .0877681   -13.61   0.000    -1.366769   -1.022724
-------------+----------------------------------------------------------------
     /athrho |  -.2576728   .1279473    -2.01   0.044    -.5084448   -.0069008
    /lnsigma |   1.424337   .0360465    39.51   0.000     1.353688    1.494987
-------------+----------------------------------------------------------------
         rho |  -.2521175   .1198145                     -.4687326   -.0069007
       sigma |   4.155104   .1497771                      3.871676     4.45928
      lambda |  -1.047575   .5254504                     -2.077438   -.0177106
------------------------------------------------------------------------------
LR test of indep. eqns. (rho = 0):   chi2(1) =     3.01   Prob > chi2 = 0.0825
```

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