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Marital Happiness and Family Economics

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I. Introduction

Economics has long been the study of maximizing production, minimizing cost, and analyzing distributions, but it was not until recently that the field of economics added the social institution of the family and subjective well being to its list. What is being expounded upon within this discussion is how marital happiness affects family economics. The question begins with how marriage affects the basic micro model of economics: utility, and in turn how marital happiness affects economic decisions made by the family, such as the amount of leisure and goods to consume.

Economic issues already analyzed within the family include joint and independent utility functions, the joint production function, distribution of economic resources, exiting constraints and more. The addition to the economic community that this discussion will be making hinges on a closer look at marriages shared goods; a good that can only be consumed within marriage, either produced by one spouse and consumed by the other or shared by both. From the shared good, we can analyze if happiness within marriage changes choices between shared goods, leisure, and private consumption, which in turn affects the personal or joint utility function when married.

The purpose of studying happiness within marriage for an economist when looking at it from the bigger picture is that it adds insights into the complex economic institution that would not otherwise be observable. The insights include how the complicated interplay of the resources allocated to shared goods and the leisure to consume them, is exchanged between private consumption. So, marital happiness, as it affects utility produced within marriage, can influence a variety of decisions. These broad definitions of goods once analyzed generically can define more specific issues such as economies of scale, income transfers, labor force participation decisions, human capital investments, and large ticket items such as a house or arguably children. In effect a happy marriage is not just interesting to sociologists and those who are married but gives insights into economic issues as well.

The lay out of this paper will be as follows. In the second section there will be a literature review to highlight important points from which to construct the model and add to the discussion. In the third section the model will be developed and used to express how marital happiness changes family economics. In section four I will look at the data and its econometric results to support the model and then conclude. Appendix B will outline the idea of happiness as an endogenous decision.

II. Literature Review

There are three main bodies of literature that play an important part in analyzing the question of how happiness affects the distribution of goods within households. Those topics are: the effects of economic variables on subjective well-being, resource allocation within the family, and family bargaining.

Marcus Aurelius, the scholar and emperor of Rome wrote, "No man is happy who does not think himself so." Happiness is subjective, wrote Campbell (1976). In addition, Shin and Johnson have written that subjective well-being is "a global assessment of a person's quality of life according to his own chosen criteria." In explaining the subjective evaluation of one's happiness, scholars often use the term "personality." Whitney (1976) claims demographic variables explain only 10% of happiness, while personality is what is often characterized as making up most of the other 90%. Personality has many definitions but generally includes ones self-esteem, extraversion or sociability, androgyny, and others. Therefore in trying to measure happiness there are two important things to note. First is none of us are exactly the same, we can only be characterized on an individual basis, and second is, we all have a few minor similarities from which we can explain the overall composition. Therefore, when analyzing happiness, one can find results that are significant but cannot measure precisely.

Turning from a sociological perspective, the economics community has given increased attention to the study of happiness. One approach taken is that of comparison; people evaluate their happiness dependent upon the people around them, Smith (1989). In a slight alteration, Easterlin (1974, 1995) describes happiness in terms of reaching aspirations or expectations. Unified theories of happiness have been discussed but what dominates the field is empirical work. Finding economic indicators of happiness has gained importance in understanding subjective well being. Economic indicators that have been found to be significant in explaining personal happiness are inflation (Oswald 1999), the unemployment rate (Di Tella 2001), residence in richer countries (Diener 1986), personal unemployment (MacCulloch and Oswald 2001), job satisfaction (Frey 2001), and financial well being (Waitte 2000).

Explaining happiness is important, but it is also important to understand how it influences decisions that are made by each individual. Kahneman, Wakker and Sarin (1997) distinguish useful variations within this evaluation of utility. For example, being happy in one's marriage is a central aspiration for Americans. Researchers (e.g., Glenn) report that over 90% of Americans identify "having a happy marriage" as one of the most important, or a very important, life objective. It follows that people who are not happy within marriage opt out.

Looking at both marriage and happiness one can find a variety of issues. At a basic level, studies of happiness have found those who are married are happier then those who are single, Glenn (1975). Some scholars feel there are selection effects that cause married persons to be happier, but overall, the consensus is that the effects of the marital relationship is stronger, (Glenn and Weaver, 1988).

Changing gears to a more encompassing discussion of economics and the family, Blau and Ferber give a comprehensive neo-classical economic outline of the benefits and costs of marriage in their book *The Economics of Women, Men, and Work.* To begin, they stipulate that there is a contract, which is proven to serve as a business agreement and therefore makes the union one not only of love but economics. They describe the benefits from marriage as comparative advantage, economies of scale, public goods, externalities, and risk sharing. The costs of marriage include sharing housework, bargaining costs, friction caused by life cycle changes, and loss of independence.

The Nobel Prize winning economist Gary Becker in his two part series "A Theory of Marriage" discusses comparative advantage. In the first article he looks at marriage as defining a family production unit. He expounds upon marginal rates of substitution to explain increasing gains in marriage and goes on to show the joint production function must produce more than if both individuals were single. In the second part of his series on "A Theory of Marriage" he wrote of caring and its ability to optimize a joint utility curve shared by everyone within the family. He made several points to support the union of utility, primarily from the hypothesis that those who care for each other would have a utility function dependent upon the others utility. Also, Becker concludes the joint utility curve is best because of its added utility from the reduction on exchange costs within the household. His idea was one utility function and one production function. Note there have been several studies by Pollak and others on how realistic it is to assume that the decisions are being made by one altruistic spouse. These studies have influenced social policy. For example, income transfers to lower income families are generally given to mothers, because they spend it more often on the family and children rather then on private consumption.

An important alteration from Becker's joint utility and joint production function came with McElroy and Horney (1981), and Manser and Brown (1980). They both expressed a separate utility function for each spouse and used a game theory setting to disperse the goods produced jointly. They centered their game on the fact that the difference between the utility of being married and the utility of being single must be greater than zero for both persons to stay married. To describe the threat point they must consider the cost of divorce and the difference in utility of marriage and being single.

Elizabeth Peters explains a more general framework for exiting a marriage within the context of unilateral divorce laws. In her view, which takes as given perfect information on alimony, the couple will choose divorce if the sum of both of their benefits from being single is greater than the sum of both benefits from remaining together.

Blau and Ferber consider a more dynamic model in terms of the joint production function and exiting. They point out that some spouses decide to stay home because it produces more utility, but it costs them professional opportunities or market wages in the long run.

The third branch of literature introduces a shared good to the analysis of household decision making. A pure public good is one that once provided, the additional cost of another person consuming the good is zero, and the prevention of someone else consuming it is very expensive or impossible. The goods exchanged between married couples are not necessarily a pure public good and therefore have been referred to as shared goods, though these goods have public good characteristics. A house and children are examples of the close alignment between the shared and public good because both spouses' consume the good at little or no expense to the other. Other goods shared are ones bought by one and consumed by the other. It is a marriage good from which both are presumably receiving utility, and therefore is a shared good. An example would be a diamond necklace or a nice tie before going to a Christmas party. On a technical basis, many economists model the shared good as a purchased good and use a constant price in their function while others define it as a home produced good[1].

The shared goods are significant and become complicated in a bargaining perspective. Who pays for what, and how much do you buy? There are several theories that propose answers within the joint decision making model. Three of the different views are the joint utility function, by Gary Becker, the individual utility function by Manser and Brown where they outline the threat point as divorce and use a cooperative Nash bargaining model, and a Nash-Cournot solution by Chen and Woolley. In any case, the shared good is an important component of marriage. It is important because it is necessary to make decisions concerning their purchases of goods which affect both

[1] Manser /Brown and W. Keith Bryant respectively

spouses, and in turn, is the good that ties together each spouse's utility function. Therefore, the economic interaction that links spouse's decisions is the shared good.

III. The Model

The background of family economics as outlined in the literature review has taken the complex institution of the family and broken it down into the regular variables known in economics. They include leisure, consumption goods-private and shared, and labor force/home production. The classic model Becker outlined has been used in many areas to analyze smaller and more direct issues of family economics. These areas are family size, intergenerational transfers, investment, risk aversion, and others. The study here is taking the basic model and tackling another important family issue: how happiness affects family economic decisions. It seems to be a dangerous step away from economics and into sociology but it is imperative to show that some social factors matter in economic decisions.

The model will hold together the heart of the discussion. Its fundamental characteristics of family economics, described in the form of a utility function, will address the question of how marital happiness affects the distribution and consumption of shared goods within the family. There are two main ideas in modeling family utility, an individual and a joint function as discussed in the literature review. The individual utility function will be used within this setting to analyze our question because within the economic community the individual function is thought of as the stronger of the two.

The individual utility function in algebraic form is:

$$U_i\left(C_i, Q_i + Q_j, l_i, H_i\right) \quad (1)$$

$$pC_i + pX_i \leq \left[(T - l_i - V_i)\, w_i + \left(T - l_j - V_j\right) w_j\right] \theta \quad (2)$$

$$Q_i = X_i + G\,(V_i) \quad (3)$$

Where l_i represents leisure of spouse i where i = m,f. C_i equals goods privately consumed by person i, and H_i is marital happiness. In the budget constraint T is total number of hours in a day, w is the wage for each spouse, and p is the price of goods. θ is an exogenous measure between zero and one, which is agreed upon at the beginning of the marriage, and splits the income between spouses. Note the choice variables made by individual j are exogenous and the budget constraint for person j would be multiplied by (1- θ) not θ. The final equation is an identity that represents the sum of the shared goods brought to the marriage by individual i. They are comprised of those bought, X_i, and home produced goods, $G(V_i)$, where V_i represents time spent producing them. Again, the definition of the shared good is a good consumed within the marriage. It can be consumed mutually or produced/bought by one and consumed by the other. Both G and X are perfect substitutes. In anticipating analyzing the independent utility functions, the Cournot-Nash equilibrium will be used to constrain decisions to be consistent with each other's. I will derive each spouse's decision, Q_i, taking the others, Q_j, as constant[2].

Marital happiness, H_i, will be considered an exogenous characteristic within the utility function when analyzed in the theoretical model[3]. The idea of it being exogenous is controversial, but is justified by an argument that considers time. The economic decisions people make effect happiness in the long run but may have no influence on marital happiness today. Therefore, marital happiness in this myopic game is the result of the accumulation of past decisions. If one argues that goods bought today affect the

[2] A cooperative game has been studied thoroughly but in this circumstance no tractable solution has been found. Chen and Woolley have used the uncooperative idea in their recent article in the Economic Journal.
[3] Appendix B explores the idea of the endogeneity of happiness in marriage.

level of happiness today then they are arguing happiness designates the optimal quantities of these goods. In effect, happiness outlines the functional form of the utility function and implies the variable is unnecessary. Yet, this argument does not work with examples like getting a college education. A decision about education is made to create happiness in the future by allowing for an increase in future choices, though it has no effect today. Therefore, happiness seems more plausibly exogenous in the short run due to everyone's inability to choose goods that affect it in the present.

When solving for the effects of happiness on the distribution of goods it is necessary to find the first order conditions associated with each choice variable. The choice variables are C_i, V_i, and l_i. The variable X_i has been substituted out using the budget constraint. Therefore the first order conditions are:

$$U_{C_i} - U_{Q_i} = 0 \qquad (4)$$

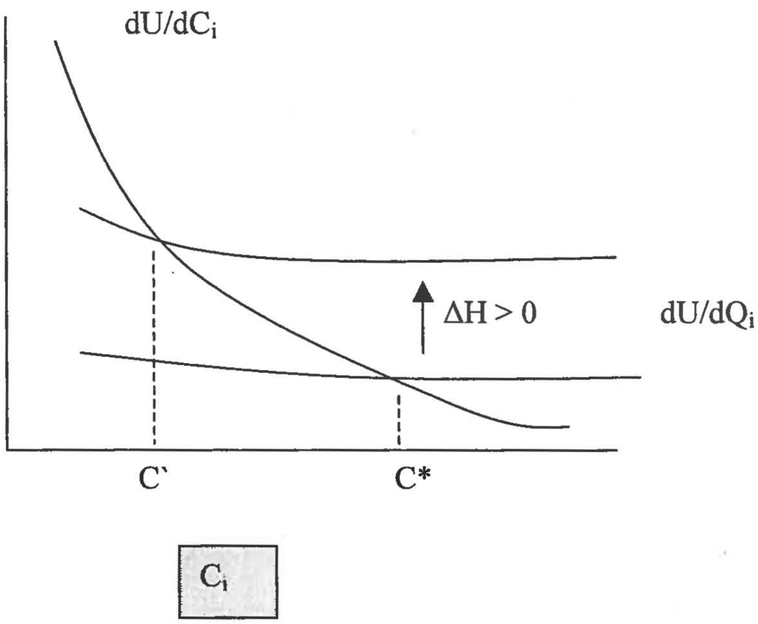
$$(-w_i/p + G_{V_i})\, U_{Q_i} \geq 0 \qquad (5)$$

$$U_{l_i} - (w_i/p)\, U_{Q_i} = 0 \qquad (6)$$

The marginal rates of substitution show the relationships between the choice variables. Equation four is the partial derivative with respect to private consumption, Eq. 5 is the parital with repect to V_i, and 6 is with respect to l_i. Since happiness is an exogenous variable, as it increases it effects the marginal rates of substitution differently. Under the assumptions that the partial derivative of marital happiness with respect to the marginal utility of the shared good is greater than zero ($dU_{Qi}/dH > 0$), and the partial derivative of happiness with respect to the marginal utility of private consumption equals zero

($dU_C/dH = 0$),[4] then private consumption falls because of equation 4. Figure 1 demonstrates this fact. As H rises then the choice variable C must fall in order to raise U_C and hold equality. Therefore moving the optimal choice from C* to C`. So in other words, marital happiness substitutes for private consumption and therefore less private consumption is needed.

Figure 1

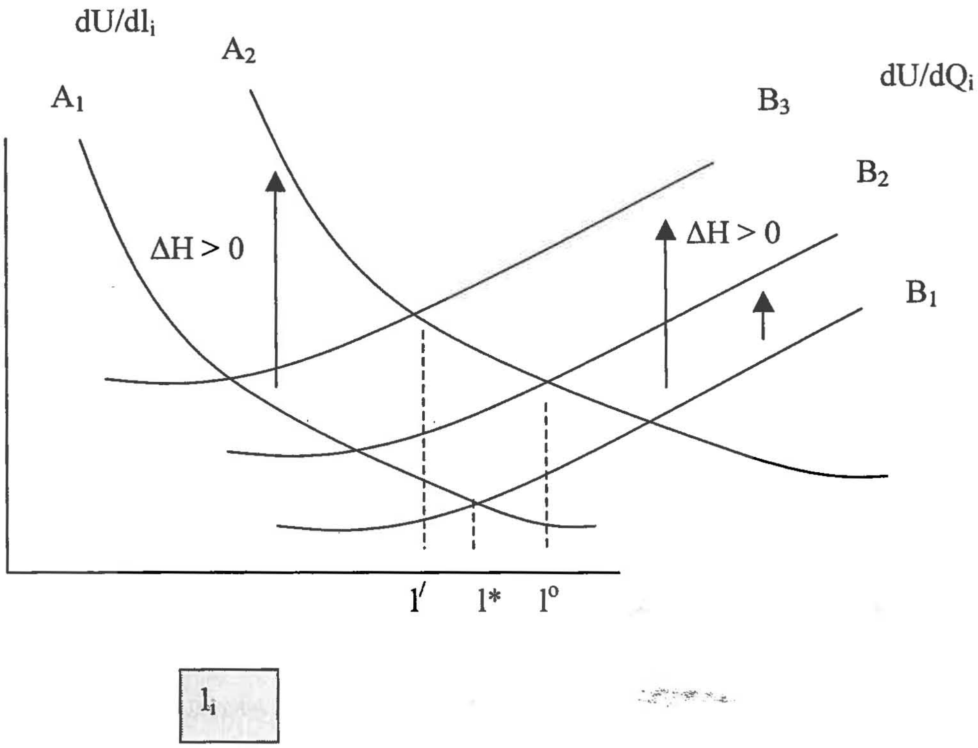


The inequality for equation 5 represents the exchange between real wage and home productivity. It demonstrates that if one earns a higher wage at home then they work at home until the home wage falls to equal their real wage in the labor force. Once this happens they will work in the labor force where there is a constant and higher return on their marginal addition to labor. Note a corner solution is possible because for the amount of work an individual does it could be that the diminishing returns to home production does not lower the home wage enough to have a higher wage in the labor

[4] Many including Chen and Woolley split up the utility function into two pieces where utility equals U(C) + V(Q,H) to allow for a clearer understanding that the partial equal zero, but to save generality one equation is used here.

force, which would mean they would do all there work at home. The inverse is also true, or the labor force wage in real terms is always higher than home production. Finally the 6^{th} equation is ambiguous in how happiness affects leisure and shared goods. A graphic of this relationship is seen in Figure 2. One can see it depends upon how happiness shifts the marginal utility curve of leisure and shared goods. 1* is the initial equilibrium of leisure and as happiness rises the partial derivative of leisure rises shifting the curve from A_1 to A_2, but also as happiness rises then the marginal utility of the shared good rises shifting the curve from B_1 to B_2 or B_3. Therefore the equilibrium point of leisure is ambiguous. It depends upon the magnitudes of the partial derivatives of martial happiness with respect to the marginal utility of leisure and shared consumption. So, the choice of leisure could rise from 1* to 1^{o}, or fall to $1^{/}$ depending.

Figure 2



The next level to understand the relationship is using comparative statics. A break down of the shared good is necessary to make the implicit function tractable. In the previous section the underlying variable of the shared good is time spent producing these goods, whether within the home directly or in the labor force in order to buy them. Realize when given constant returns to scale of home production then shared goods can be represented as one choice variable because of equation 5, call the simplified version of the shared good Z.[5] I will use Z for both spouses to represent the shared good Q in order to simplify the comparative static results.

Under the assumption that maximization is feasible and the 2nd order conditions are met we can and will employ comparative statics. From Appendix A one can see the twenty-eight equations expressing these relationships. Only the variables dealing with happiness and its affect on shared goods will be analyzed. Again, the Cournot-Nash equilibrium is being employed where the spouse's addition to the shared good is held constant. After the statics are analyzed the issue of the equilibrium between each spouse's shared contributions will be taken into account.

The first step is explaining the signs of the partial derivatives. We must draw on assumptions from microeconomic theory to decide on the signs of the 2nd order derivatives.

$$U_{CC},\ U_{ll},\ U_{ZZ},\ U_{CZ} < 0 < U_{Cl},\ U_{Zl},\ U_{ZH},\ U_{lH} \qquad (7)$$

Explanation of these relationships is necessary. The partial derivatives below zero are negative from standard economic theory; the more goods an individual has the more utility he/she has but at a diminishing rate. U_{cz} is arguably negative but observe they are

[5] Constant returns isn't imposed but in this situation it can be applied without loss in generality for the person at the corner where no home production is done, and little for the person at equality or the opposite corner, the home producer.

both goods. U_{cl} and U_{Zl} are positive because they are complimentary goods. Marital happiness with respect to leisure (partly consumed with your spouse) and shared goods are positive because it is considered as an efficiency parameter. As happiness goes up then the utility from the shared goods and leisure goes up. The last sign condition is $U_{cH} \approx 0$. The idea was expressed previously.

Looking specifically at the tradeoffs with respect to marital happiness and shared goods (dZ_i/dH) we find equation 8:

$$dZ_i / dH = p^2 U_{ll} U_{zh} - p^2 U_{lh} U_{zl} - p U_{cc} U_{lh} w_i + p U_{cz} U_{lh} w_i + U_{cc} U_{zh} w_i^2 + p U_{cl} (p U_{lh} - 2 U_{zh} w_i) \quad (8)$$

Notice if $(w_i/p)U_{ZH}$ is larger than U_{lH} then equation 8 is necessarily negative and the relationship $dZ_i/dH > 0$ because of the determinate, which was divided out initially to simplify the equation, is negative. The result is logical and the relationship was also expressed previously in Figure 2.

Considering the relationship between personal consumption and marital happiness (dC_i/dH).

$$dC_i / dH = -p^2 U_{ll} U_{zh} + p^2 U_{lh} U_{zl} + p U_{cz} U_{lh} w_i + p U_{zh} U_{zl} w_i - p U_{lh} U_{zz} w_i - U_{cz} U_{zh} w_i^2 + p U_{cl} (-p U_{lh} + U_{zh} w_i) \quad (9)$$

Again with the long equation the relationship is difficult to decipher. The equation also hinges upon the relationship $(w_i/p)U_{ZH} > U_{lH}$. If true then as marital happiness rises private consumption falls, $dC_i/dH < 0$.

Leisure with respect to happiness (dl_i/dH) under the comparative static results are:

$$dl_i / dH = p (p (U_{cl} U_{zh} - U_{zh} U_{zl} + U_{lh} U_{zz}) + U_{cc} (p U_{lh} - U_{zh} w_i) + U_{cz} (-2 p U_{lh} + U_{zh} w_i)) \quad (10)$$

Even after the algebraic simplification, the result takes another level of speculation in comparison to the previous two relationships, and therefore no sign will be determined.

Since the trade off between leisure and private/shared goods is vague, empirical results will be analyzed to further highlight this relationship. Also, a magnitude will be identified of the relationship between private goods falling and shared goods rising. For example, if leisure is going up for one spouse then the purchases for that spouse must be going down, and private consumption is falling faster than shared consumption is rising due to the income constraint. The inverse is also true.

In either analysis the last major issue with the individual model is if the quantity of shared goods rise in equilibrium. The answer lies at the intersection of the reaction functions:

$$Q_i = t_i\,(p, w_i, w_j, H_i, Q_j) \qquad (11)$$

$$Q_j = t_j\,(p, w_j, w_i, H_j, Q_i) \qquad (12)$$

Chen and Wooley have solved for a unique equilibrium and found the reaction functions are negatively sloped[6]. There are two possible solutions, an interior and a corner. The two solutions are represented graphically in Figures 3. Letting Q_j's reaction function be constant then $Q^A{}_i$ represents an interior solution at point "A" where the equilibrium is for individual i to purchase and/or produce $Q^*{}_i$ and spouse j to share $Q^*{}_j$. At this point neither can do better. The alternative is a corner solution, which is represented by the reaction function $Q^B{}_i$, and the equilibrium is point "B" where person j is the only one who purchases or produces shared goods, $Q^0{}_j$.

It is important to note that an argument could be made that if no shared goods are consumed or produced by individual j that are from i, then j is receiving nothing from i, or the marriage, and will choose to opt out but note that in some instances individuals receive utility when sharing with the other.

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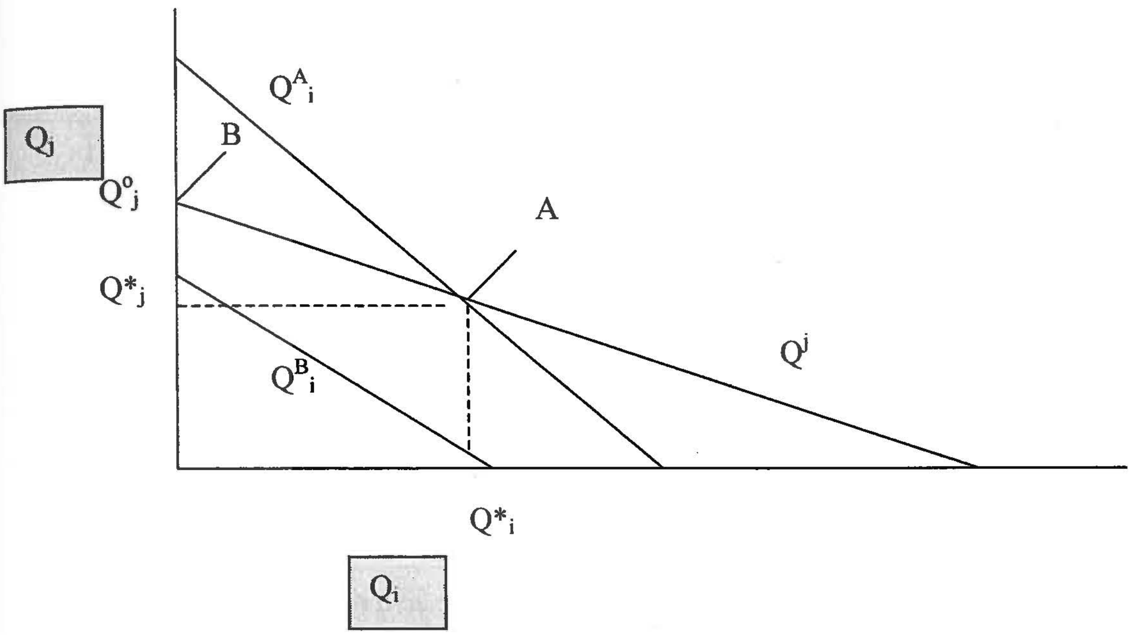
[6] Economic Journal, Oct. 2001 p. 722

Figure 3



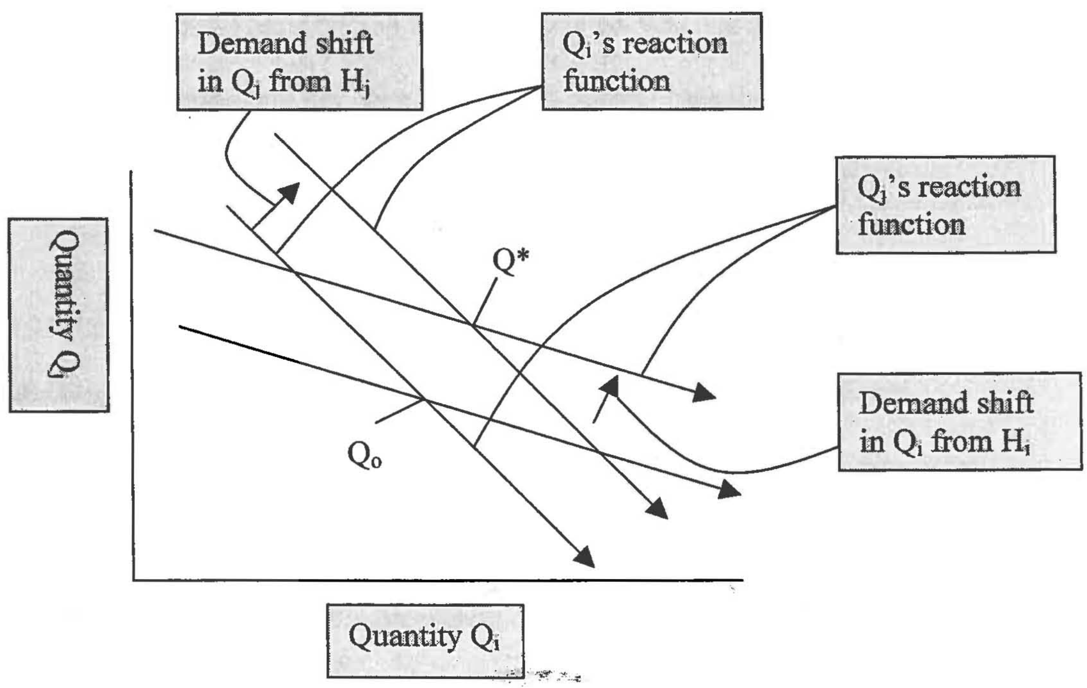
In either case there exists a threat point to leaving the marriage, where the utility from being married is less then being single, or married to someone else, then exit will ensue. The only way for one spouse to insure this does not happen is through increasing their Q. It is not the point to say that marriage will not exist above or at the threat point, but to say that there is at least one equilibrium for Q and Q must be greater then zero.

If the happiness of one spouse increases then the spouses demand for shared goods rises. Therefore, a spouses' reaction function, depending upon the other spouses' shared good contribution, will shift out. Since the reaction functions are negatively sloped, then as one reaction function shifts out, the overall sum of Q will not necessarily increase because the other spouse will reduce their personal addition. Notice if the spouse on the vertical axis' slope is more than 45 degrees, or negative one at the point of equilibrium then it is impossible for the horizontal axis spouse to increase Q because every extra shared good they buy the other spouse will stop buying one or more.

Therefore, the necessary equilibrium under which the spouse will purchase more shared goods depends upon Q_j.

Further understanding can be gained. Remember there are two cases to consider due to the interior and corner solution. Considering the corner situation, if the interior reaction function shifts due to the change in happiness then nothing will happen unless it shifts out to create an interior solution. If the exterior persons reaction function shifts then the sum of Q's will rise because it is the exterior spouse that determines the amount of shared goods. When the alternative interior solution exists, then under an additional stipulation that marital happiness for person "i" is positively correlated with person j[7] then overall shared goods rise. Under the assumption then there will be a rise in shared goods as shown in Figure 4 from Qo to Q* because both reaction functions are shifting

<u>Figure 4</u>



[7] The stipulation relies on the ideas that both spouses live through almost identical experiences and they affect each spouse in a similar manner. Therefore if an experience causes marital happiness to rise for one spouse then the other spouse's happiness is also rising.

out. If happiness does not rise for the other spouse then the spouse's reaction function may or may not shift out due to its dependence upon the choice made by their spouse.

A corollary from this conclusion is the effect on the likelihood of divorce. In utility terms, Elizabeth Peters expresses the likelihood of divorce as:

$$(U^i_m + U^j_m) - (U^i_s + U^j_s) = a \quad \text{where } a \geq 0 \text{ if married} \qquad (13)$$

M stands for the utility in marriage and S if single. What the model here has shown is as happiness in marriage increases then "a" is growing which makes the possibility of divorce smaller. Also, recognize if only one spouse's happiness rises and the other does not, and the reaction functions of the other spouses' yields no increase in shared goods, then this situation is not necessarily true.

In conclusion of the theoretical section it has been found that as marital happiness rises then the demand for shared goods increases and the demand for private goods fall while leisure is ambiguous. Therefore the empirical section will use the General Social Survey to analyze the relationship between leisure and marital happiness.

IV. Data and Econometric Results

The data being analyzed is from the General Social Survey. The National Opinion Research Center (NORC) located at the University of Chicago has administered the survey annually from 1972 to 1994 with the exceptions of 1979, 1981, and 1992, and then in even years since. The survey is cross-sectional and is administered in face-to-face interviews from approximately February 1st to the second week of April. They question approximately 1,500 people each year who are 18 and over in the 48 continental states.

The central question in the GSS pertinent to this paper is the question on the subject's marital happiness. The question is posed

> Taken all together, how would you describe your marriage? Would you say that you are very happy (3), pretty happy (2), or not too happy (1)[8]?

The question is answered by more than 99% of the married respondents. The question's reliability and validity have been extensively studied by Diner (1994) and Beethoven (1993) with respect to this surveys measurement of personal subjective well being. Their results say the measurement is subjective but captures substantial amounts of variance on the respondent's feelings of happiness. In addition, they argue people usually try to balance happiness and unhappiness to take the overall picture when attempting to answer the question.

It is the purpose here only to use subjective well being data as a general insight into the process of choice. A countering point many economists argue is subjective happiness indicators are unimportant in comparison to studying the actual choices made by the individual. Choices are a more objective, calculable, and direct measure in analyzing the theory of optimizing utility functions. I use subjective indicators not as a final destination, but to extend the understanding of family economics and choices made within the institution from a more social interaction standpoint. The variable can be used to expose the complex structure of economic choices made within a family that is hard to observe because of the many issues that cloud choices.

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[8] Histogram found in Appendix B

Table 2 in appendix C shows sample statistics for the variables described in Table 1 of the same appendix. Table 3 is the correlation matrix, and Table 4 the covariance matrix.

The three observable goods that apply to the theoretical model include paid work hours, home production time, and marital happiness. The two dependent variables, work hours and home produced goods[9], will be analyzed using OLS and then extended in using a variety of other econometric techniques to see if anything else can be added. Marital happiness will be used as an exogenous variable to explain the work decision[10]. From the theoretical section this relationship will express the exchange between the rise of shared goods and the fall of private goods.

The two dependent variables can be represented in functional form as:

$$L = f\,(X, D, H^m) \qquad (14)$$

$$V = g\,(X, D, H^m) \qquad (15)$$

Where L is labor force participation, V is home production in hours, X is a vector of variables which include:

> age, age squared, age of spouse, children, education of respondent, family income, log of family income, financial relative position, personal income, race, respondent's employment status, spouses work hours, and sex

The D's are:

> Occupation of respondent, year, and aggregate unemployment

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[9] The home production question is asked for two years, 1994 and 1996. It has been weighted to approximate the work hours involved using "The Dollar Value of the Day."

[10] Appendix B

The D's have been separated out because, as footnoted above, happiness will be expressed as a dependent variable and we will use D as an instrument to eliminate correlation between error terms, or endogeneity, and produce consistent coefficients[11].

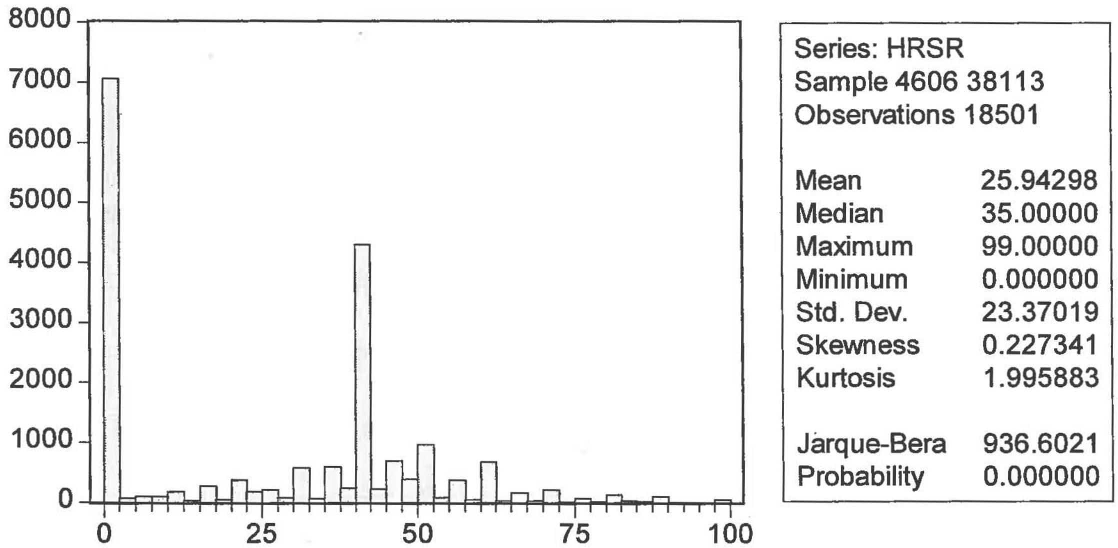
The regression results are in Appendix C. In interpreting the results table 5.1 estimates equation 14 for the entire sample using OLS. A few variables to note are that marital happiness is negative and significant. The sign is negative which was the question left unanswered in the theoretical section. Therefore, as happiness rises then people choose to work less outside in order to consume the happiness at home. The log of family income is positive but the linear interpretation is negative, which is measuring a second derivative that is negative. The male demographic is positive, displaying the gender relationship within homes. Spouses work hours is positively correlated. Interesting but not surprising because those who work more are usually more ambitious and are attracted to or run in circles who have similar characteristics.

Table 8.1 estimates equation 15 using OLS. Marital happiness is close to being negatively significant, but a likely explanation is there are some spouses' who are "trapped," meaning divorce is costly because of a low outside wage. Therefore they are doing all their work at home and are at a corner point from which they do not wish to move because their threat point is low, i.e. they have no outside options[12], but feel trapped within the marriage and therefore unhappy. Notice the positive relationship to children, the gender role, and a seemingly bargaining rule over the spouses' labor force participation. The R^2 has fallen in comparison to wage hours but the variable is discrete and the variation is small.

[11] Realize in the sub-sample that year and aggregate unemployment will not be used.
[12] The coefficient is insignificant if the answer of doing all the work within the home is excluded.

In Table 5.2 the technique of censoring has been used. The idea behind it is the variable has a large cluster of people not working therefore the estimates will be weighted heavily at zero and using OLS will not estimate those not at zero with as accurate a variation as it could. Therefore the Censoring technique allows for a probabilistic function to take into account the large number of observations clustered together. One can see in figure 5 the number of respondents at zero.

Figure 5



Under further speculation, the zero significance measured in Table 8.1, which explains home produced goods and represents part of the shared good, does not contradict the model that as marital happiness rises then shared goods rise. The amount of home production should not change as martial happiness rises and therefore the zero significance is a good measure. In equation 5, the marginal home production and real wage equaled if the spouse was at the interior solution. Therefore, if a spouse is at an interior equilibrium or at the horizontal corner then there are decreasing marginal returns to home production. So, to increase shared goods the individual will buy them instead of produce them at home because they are cheaper due to the constant wage over price. Therefore relying more heavily upon table 5.1 we can see the relationship of leisure. As marital happiness rises then work hours, L, that are spent earning wages goes down, which due to the equality in equation 5 concludes logically that leisure rises. Therefore, the question, which was left open in the theoretical section, is answered. As happiness rises then leisure rises in order to consume the newly created happiness. Also, privately consumed goods are falling faster then shared goods are rising, due to the financial constraint.

VI. Conclusion

The study of marital happiness using an individual utility function under a Nash-Cournot equilibrium produces several economic results. The exogenous variable impacts the resource distribution within the family through the three basic primary goods: privately consumed, shared consumption, and leisure. Theoretically, private consumption always falls and shared goods rise, provided there is a constant wage and price and that either marital happiness is correlated or there exists a particular corner solution. Empirically, the relationship of leisure displays a positive relationship. If happiness rises, then spouses spend more time at home consuming it, and consequently, on average, shared goods rise slower then private consumption falls.

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Appendix A

The Utility function is:

$$U^i\,(C_i,\ Z_i + Z_j,\ l_i,\ H_i)$$

Setting up the Lagranian:

$$L^i = U^i\,(C_i,\ Z_i + Z_j,\ l_i,\ H_i) + \lambda[[(T - l_i)\,w_i + (T - l_j)\,w_j]\,\theta\ - pC_i - pZ_i]$$

And its first order conditions are:

$$L_{C_i} = U^i{}_{C_i} - p\lambda = 0$$
$$L_{Z_i} = U^i{}_{Z_i} - p\lambda = 0$$
$$L_{l_i} = U^i{}_{l_i} - \lambda = 0$$
$$L_\lambda = [[(T - l_i)\,w_i + (T - l_j)\,w_j]\,\theta\ - pC_i - pZ_i] = 0$$

And second orders:

$$U_{cc}\,dc + g\,U_{cz}\,dz_i + U_{cl}\,dl_i - p_c\,d\lambda = -U_{cz}\,dz_j - U_{cH}\,dH$$
$$gU_{cz}\,dc + U_{zz}\,dx_i + gU_{zl}\,dl_i - pd\lambda = -U_{zz}\,dz_j - U_{zH}\,dH$$
$$U_{cl}\,dc + g\,U_{zl}\,dz_i + U_{ll}\,dl_i - d\lambda = -U_{zl}\,dz_j - U_{lH}\,dH$$
$$-pdc - pdx - w_i\,dl =$$
$$-(w_i + w_j)\,\theta\,dT - \theta\,(T - l_i)\,dw_i - \theta\,(T - l_j)\,dw_j - [(T - l_i)\,w_i + (T - l_j)\,w_j]\,d\theta + (C + Z)\,dp$$

In Matrix form as:

$$\begin{pmatrix} U_{cc} & U_{cz} & U_{cl} & -p \\ U_{cz} & U_{zz} & U_{zl} & -p \\ U_{cl} & U_{lz} & U_{ll} & -w_i \\ -p & -p & -w_i & 0 \end{pmatrix} \begin{pmatrix} dc_i \\ dx_i \\ dl_i \\ d\lambda \end{pmatrix} =$$

$$\begin{bmatrix} -U_{cz} & -U_{ch} & 0 & 0 & 0 & 0 & 0 \\ -U_{zz} & -U_{zh} & 0 & 0 & 0 & 0 & 0 \\ -U_{zl} & -U_{zh} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -(w_j + w_i)\theta & -(T - l_i)\theta & (T - l_j)\theta & [(T - l_i)\cdot w_i + (T - l_i)\cdot w_i]\theta & (C + Z) \end{bmatrix} \begin{pmatrix} dz_j \\ dH_i \\ dT \\ dw_i \\ dw_j \\ d\theta \\ dp \end{pmatrix}$$

Let the above equation be simplified into matrix notation A*x = B*d. The manipulation "x/d = A^{-1}*B" expresses each relationship d(choice variable)/d(exogenous variable) which are used in section 3. The results are[13]:

$$\{\{p\,(p\,(U_{zl}^2 - U_{ll} U_{zz}) + U_{cz}\,(p\,U_{ll} - U_{zl} w_i) + U_{cl}\,(-p\,U_{zl} + U_{zz} w_i)),\ -p^2 U_{ll} U_{zh} +$$
$$p^2 U_{lh} U_{zl} + p\,U_{cz} U_{lh} w_i + p\,U_{zh} U_{zl} w_i - p\,U_{lh} U_{zz} w_i - U_{cz} U_{zh} w_i^2 + p\,U_{cl}\,(-p\,U_{lh} + U_{zh} w_i),$$
$$\theta\,(p\,(U_{zl}^2 - U_{ll} U_{zz}) + U_{cz}\,(p\,U_{ll} - U_{zl} w_i) + U_{cl}\,(-p\,U_{zl} + U_{zz} w_i))\,(w_i + w_j),$$
$$\theta\,(T - l_i)\,(p\,(U_{zl}^2 - U_{ll} U_{zz}) + U_{cz}\,(p\,U_{ll} - U_{zl} w_i) + U_{cl}\,(-p\,U_{zl} + U_{zz} w_i)),$$
$$\theta\,(T - l_j)\,(p\,(U_{zl}^2 - U_{ll} U_{zz}) + U_{cz}\,(p\,U_{ll} - U_{zl} w_i) + U_{cl}\,(-p\,U_{zl} + U_{zz} w_i)),$$
$$(p\,(U_{zl}^2 - U_{ll} U_{zz}) + U_{cz}\,(p\,U_{ll} - U_{zl} w_i) + U_{cl}\,(-p\,U_{zl} + U_{zz} w_i))\,((T - l_i)\,w_i + (T - l_j)\,w_j),$$
$$(C + Z)\,(-p\,U_{zl}^2 + p\,U_{ll} U_{zz} + U_{cz}\,(-p\,U_{ll} + U_{zl} w_i) + U_{cl}\,(p\,U_{zl} - U_{zz} w_i))\},$$
$$\{-p^2 U_{zl}^2 + p^2 U_{ll} U_{zz} - p\,U_{cc} U_{zl} w_i - U_{cz}^2 w_i^2 + U_{cc} U_{zz} w_i^2 +$$
$$p\,U_{cz}\,(-p\,U_{ll} + (U_{cl} + 2\,U_{zl})\,w_i) + p\,U_{cl}\,(p\,U_{zl} - 2\,U_{zz} w_i),$$
$$p^2 U_{ll} U_{zh} - p^2 U_{lh} U_{zl} - p\,U_{cc} U_{lh} w_i + p\,U_{cz} U_{lh} w_i + U_{cc} U_{zh} w_i^2 + p\,U_{cl}\,(p\,U_{lh} - 2\,U_{zh} w_i),$$
$$\theta\,(p\,U_{cl}^2 + p\,U_{cz} U_{ll} - U_{cl}\,(p\,U_{zl} + U_{cz} w_i) + U_{cc}\,(-p\,U_{ll} + U_{zl} w_i))\,(w_i + w_j),$$
$$\theta\,(T - l_i)\,(p\,U_{cl}^2 + p\,U_{cz} U_{ll} - U_{cl}\,(p\,U_{zl} + U_{cz} w_i) + U_{cc}\,(-p\,U_{ll} + U_{zl} w_i)),$$
$$\theta\,(T - l_j)\,(p\,U_{cl}^2 + p\,U_{cz} U_{ll} - U_{cl}\,(p\,U_{zl} + U_{cz} w_i) + U_{cc}\,(-p\,U_{ll} + U_{zl} w_i)),$$
$$(p\,U_{cl}^2 + p\,U_{cz} U_{ll} - U_{cl}\,(p\,U_{zl} + U_{cz} w_i) + U_{cc}\,(-p\,U_{ll} + U_{zl} w_i))\,((T - l_i)\,w_i + (T - l_j)\,w_j),$$
$$(C + Z)\,(-p\,U_{cl}^2 - p\,U_{cz} U_{ll} + U_{cl}\,(p\,U_{zl} + U_{cz} w_i) + U_{cc}\,(p\,U_{ll} - U_{zl} w_i))\},$$
$$\{p\,(p\,U_{cl}\,(-U_{cz} + U_{zz}) + U_{cz}\,(-p\,U_{zl} + U_{cz} w_i) + U_{cc}\,(p\,U_{zl} - U_{zz} w_i)),$$
$$p\,(p\,(U_{cl} U_{zh} - U_{zh} U_{zl} + U_{lh} U_{zz}) + U_{cc}\,(p\,U_{lh} - U_{zh} w_i) + U_{cz}\,(-2\,p\,U_{lh} + U_{zh} w_i)),$$
$$-\theta\,(p\,U_{cl}\,(U_{cz} - U_{zz}) + U_{cz}\,(p\,U_{zl} - U_{cz} w_i) + U_{cc}\,(-p\,U_{zl} + U_{zz} w_i))\,(w_i + w_j),$$
$$-\theta\,(T - l_i)\,(p\,U_{cl}\,(U_{cz} - U_{zz}) + U_{cz}\,(p\,U_{zl} - U_{cz} w_i) + U_{cc}\,(-p\,U_{zl} + U_{zz} w_i)),$$
$$-\theta\,(T - l_j)\,(p\,U_{cl}\,(U_{cz} - U_{zz}) + U_{cz}\,(p\,U_{zl} - U_{cz} w_i) + U_{cc}\,(-p\,U_{zl} + U_{zz} w_i)),$$
$$(p\,U_{cl}\,(U_{cz} - U_{zz}) + U_{cz}\,(p\,U_{zl} - U_{cz} w_i) + U_{cc}\,(-p\,U_{zl} + U_{zz} w_i))\,((-T + l_i)\,w_i + (-T + l_j)\,w_j),$$
$$(C + Z)\,(p\,U_{cl}\,(U_{cz} - U_{zz}) + U_{cz}\,(p\,U_{zl} - U_{cz} w_i) + U_{cc}\,(-p\,U_{zl} + U_{zz} w_i))\},$$
$$\{p\,(U_{cz}^2 U_{ll} - 2\,U_{cl} U_{cz} U_{zl} + U_{cl}^2 U_{zz} + U_{cc}\,(U_{zl}^2 - U_{ll} U_{zz})),\ p\,U_{cl}^2 U_{zh} +$$
$$U_{cz}\,(p\,U_{ll} U_{zh} + U_{lh}\,(-p\,U_{zl} + U_{cz} w_i)) - U_{cl}\,(p\,(U_{zh} U_{zl} - U_{lh} U_{zz}) + U_{cz}\,(p\,U_{lh} + U_{zh} w_i)) +$$
$$U_{cc}\,(-p\,U_{ll} U_{zh} + U_{zh} U_{zl} w_i + U_{lh}\,(p\,U_{zl} - U_{zz} w_i)),$$
$$\theta\,(U_{cz}^2 U_{ll} - 2\,U_{cl} U_{cz} U_{zl} + U_{cl}^2 U_{zz} + U_{cc}\,(U_{zl}^2 - U_{ll} U_{zz}))\,(w_i + w_j),$$
$$\theta\,(T - l_i)\,(U_{cz}^2 U_{ll} - 2\,U_{cl} U_{cz} U_{zl} + U_{cl}^2 U_{zz} + U_{cc}\,(U_{zl}^2 - U_{ll} U_{zz})),$$
$$\theta\,(T - l_j)\,(U_{cz}^2 U_{ll} - 2\,U_{cl} U_{cz} U_{zl} + U_{cl}^2 U_{zz} + U_{cc}\,(U_{zl}^2 - U_{ll} U_{zz})),$$
$$(U_{cz}^2 U_{ll} - 2\,U_{cl} U_{cz} U_{zl} + U_{cl}^2 U_{zz} + U_{cc}\,(U_{zl}^2 - U_{ll} U_{zz}))\,((T - l_i)\,w_i + (T - l_j)\,w_j),$$
$$-(C + Z)\,(U_{cz}^2 U_{ll} - 2\,U_{cl} U_{cz} U_{zl} + U_{cl}^2 U_{zz} + U_{cc}\,(U_{zl}^2 - U_{ll} U_{zz}))\}\}$$

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[13] The matrices are still in Mathematica form. To help understand, the brackets within the first opening bracket represents each row, and the commas represent columns in that row unless between an opening and closing of a bracket which signals a change to the next row. For example the 1st row and 1st column of matrix "a" is U_{cc}, the 1st row 4th and last column is –p, the 2nd row 2nd column is U_{zz} and so on.

Appendix B

An interesting speculation and one that will assuredly be raised is the question; is marital happiness exogenous? Outlining the question in functional form using the measurable variables are:

$$L = f(X, D, V, H^m) \quad (14)$$
$$V = g(X, D, L, H^m) \quad (15)$$
$$H_i^m = k(X, Y, V, L) \quad (16)$$

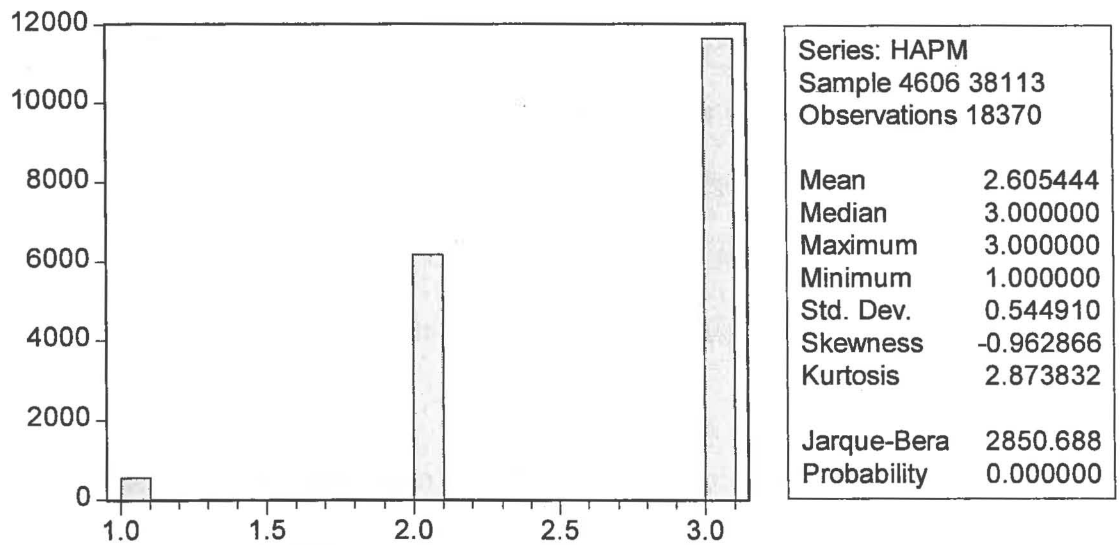
The Y's (D's) are the set of variables that express marital happiness (Labor and home production) and are exogenous of the labor force and home production (marital happiness) function. So two stage least squares will be used to extract the endogeneity using the identification variables of Y and D. In other terms the instrumental variables Y and D will enable the separation of the correlation between the error term of the functions g and f (k) with respect to H^m (L, V) and then use the new value to find k (g and f). The new estimated equation will produce consistent estimates for the coefficients of the variables if marital happiness is endogenous to labor decisions. Therefore the two stages are first finding $H^{m\ Hat} = v(X,Y,D)$, the reduced form, and then in the second stage estimating $L=g(X,D,V,H^{m\ Hat})$ and $V = g(X,D,L,H^{m\ Hat})$. Therefore $H^{m\ Hat}$ has the statistical properties of the exogenous variables Y and D. The same is done to find L^{Hat} and V^{Hat}.

The arguments made against the technique come in the form of what to decide on being instrumental variables, Y and D. The identification variables hold two theoretical assumptions when being chosen that can be brought under scrutiny. The questioning is not only open to the assumption that they are exogenous as stated above, but also that there's a significant correlation between Y and H^m, and D and L/V which is necessary to capture enough L and V in L hat and V hat, or H in H^m hat depending. After serious consideration and inspection the variables have been chosen carefully in order to satisfy the assumptions. The variables included in Y are:

> religious intensity, parent's marital status at 16, and difference in spouses' education[14]

In interpreting the results, table 6.1 is the reduced form for equation 14 and table 6.2 is the structural form. An important note to make early on is marital happiness has an R^2 of .05 which is lower then the stated value of what personal happiness regressions run which is .10 as mentioned in the literature review. The primary reason for the drop is the smaller variation in the variable as shown in figure 6. Plus, the variables are not the same but only similar and therefore cannot be implied to give approximately the same R^2.

Figure 6



[14] Years of marriage cannot be used because of the lack of measurement for those already divorced.

Tables 9.1 is the reduced form for equation 15 and table 9.2 is the structural form. The major result is $H^{m\ Hat}$ is not correlated with home production which again confirms the results found in the econometric section of the paper.

Table 7.1 and 10.1 breaks down marital happiness into a zero-one variable. The binary variable sets marital happiness to one if the respondent answered three, zero if they answered one, and excluded otherwise. The idea is to measure the extremes and create a higher R^2 while seeing what happens. This alternative approach enables the ability to run a probit regression while estimating marital happiness in the reduced form. It also makes sense because the coefficient for marital happiness in tables 5.1 or 5.2 is much smaller then in table 6.2 which means the the variables is blowing up within the reduced form and is lying outside of the possible answer choices. Therefore, the probit regression is used because it estimates the variable using a probabilistic function, one that curves within the small space of zero and one, instead of a straight line which at the extremes quite possibly lies outside the possibility of the answer choices. Therefore, the binary approach is insightful and possibly preferable. The alternative does produced a higher R^2 as measured with the McFadden R-squared from .045 to .08. Also, the income variables and personal unemployment becomes a significant factor in measuring the variable.

Other variations have been used between the choice of numbering the binary variable, ordered regressions, censored, and OLS for the whole and sub-sample but no alternative results have been found.

Appendix C

Table 1:

Variables

Age	age of respondent
Age_sq	age of respondent squared
Agesp	age of spouse
Black	Race black
Childs	number of children
Edr	number of years of schooling of respondent
Eds	number of years of schooling of spouse
Ed_dif	difference in education between spouses in years, Edr - Eds
Faminc	income of family
Faminc_log	log of Faminc
Finrela	respondent's opinion of financial relative position, number 1 to 9, 9 high
Gdpdeflator	indicator of inflation, as a percentage
Hapmar	respondent's opinion on marital happiness, 1 to 3, 3 high
Hapmbin	1 if hapmar = 3, 0 other wise
Hapmbin2	1 if hapmar = 3, 0 if hapmar = 1, NA otherwise
Hrsr	respondents labor force participation in hours for that week
Hrssp	spouses labor force participation in hours for that week
Hwrkr2	respondents amount of effort in home production, weighted from 0-28
Hwrksp	spouses amount of effort in home production, 1-5 variable, 5 high
Hwdif	Hwrkr- Hwrksp
Inc	respondents personal income
Male	gender of respondent, 1 if male
Married	respondents marital situation, 1 if married
Other	Race other than black or white
Partog	Respondent parents marital status at age 16, 1 if together
Relint	respondents religious intensity, dummy, 1 if attend church weekly
Rocc*	respondents occupation
Clerical	
Craftsman	
Farmer	
Manage	
Operative	respondent works in industrial sector
Prof	respondent works in a professional field
Service	respondent works in Service sector
Translabor	respondent works in transportation
Runemp	respondent employment status, 1 if unemployed, zero otherwise
White	race white
Year	value 1974-1998

Table 2:

Sample Statisitics:

Variables	Mean	Median	Maximum	Minimum	Std. Dev.	Observations
HRSR	25.94	35.00	99.00	0.00	23.37	18501.00
HAPM	2.59	3.00	3.00	0.00	0.59	18501.00
AGE	45.58	43.00	99.00	18.00	15.60	18501.00
AGESP	43.87	41.00	99.00	15.00	15.87	17430.00
CHILDS	2.32	2.00	9.00	0.00	1.72	18501.00
EDR	12.65	12.00	20.00	0.00	3.10	18454.00
EDS	12.62	12.00	20.00	0.00	3.08	18297.00
FAMINC	31.68	25.59	162.61	0.00	28.40	18501.00
FINRELA	3.05	3.00	9.00	1.00	0.93	18501.00
INC	13.60	6.03	201.64	0.00	19.84	18501.00
MALE	0.47	0.00	1.00	0.00	0.50	18501.00
PARTOG	0.77	1.00	1.00	0.00	0.42	18501.00
BLACK	0.09	0.00	1.00	0.00	0.28	18501.00
OTHER	0.03	0.00	1.00	0.00	0.17	18501.00
WHITE	0.88	1.00	1.00	0.00	0.32	18501.00
RELINT	0.39	0.00	1.00	0.00	0.49	18501.00
RUNEMP	0.02	0.00	1.00	0.00	0.14	18501.00
HRSSP	26.88	38.00	99.00	0.00	23.38	18501.00
HWRKR2	10.27	9.00	30.00	0.00	9.47	2192.00

Table 3: Correlations

	HRSR	HAPM	AGE	AGESP	CHILDS	EDR	EDS	FAMIN(	FINREL	INC	MALE	PARTO	BLACK	OTHER	WHITE	RELINT	RUNE
HRSR																	
HAPM	.00																
AGE	-.31	.02															
AGESP	-.32	.01	.92														
CHILDS	-.13	-.05	.31	.27													
EDR	.25	.05	-.21	-.20	-.22												
EDS	.17	.07	-.22	-.19	-.20	.62											
FAMIN(	.21	.04	-.07	-.07	-.03	.34	.32										
FINREL	.13	.05	.04	.04	-.04	.27	.25	.33									
INC	.48	.03	-.10	-.13	-.03	.29	.18	.61	.22								
MALE	.34	.05	.09	.01	.00	.03	-.02	.05	.02	.37							
PARTO	.03	.04	.01	.01	-.03	.11	.08	.07	.05	.05	.01						
BLACK	.01	-.10	-.02	-.02	.08	-.08	-.08	-.08	-.08	-.04	.00	-.12					
OTHER	.02	.00	-.05	-.05	.01	.00	.00	-.03	-.02	-.01	-.01	-.01	-.05				
WHITE	-.02	.09	.04	.04	-.07	.07	.07	.09	.08	.04	.01	.12	-.85	-.47			
RELINT	-.09	.09	.11	.11	.10	-.01	-.01	-.05	-.02	-.08	-.11	.04	.08	.00	-.07		
RUNEM	-.16	-.02	-.05	-.06	.00	-.06	-.05	-.05	-.09	-.01	.10	-.01	.02	.01	-.02	-.04	
HRSSP	.10	-.01	-.36	-.32	-.12	.16	.23	.17	.11	-.07	-.33	.00	.01	.02	-.02	-.01	-.04

Table 4: Covariances

	HRSR	HAPM	AGE	AGESP	CHILDS	EDR	EDS	FAMINC	FINREL	INC	MALE	PARTO	BLACK	OTHER	WHITE	RELINT	RUNEM	HRSSP
HRSR	545.69																	
HAPM	.01	.32																
AGE	-112.57	.16	240.4															
AGESP	-116.42	.06	224.8	250.24														
CHILDS	-5.31	-.05	8.17	7.28	2.89													
EDR	17.94	.08	-10.24	-9.6	-1.15	9.51												
EDS	12.42	.13	-10.24	-9.46	-1.06	5.87	9.41											
FAMINC	141.8	.66	-29.72	-31.16	-1.39	29.69	28.42	814.77										
FINREL	2.84	.03	.51	.53	-.07	.75	.7	8.62	.82									
INC	222.9	.31	-32.15	-41.12	-1.16	17.95	11.08	345.62	4.	396.62								
MALE	3.95	.01	.72	.09	.00	.04	-.03	.7	.01	3.69	.25							
PARTO	.26	.01	.08	.09	-.03	.14	.1	.84	.02	.44	.0026	.18						
BLACK	.04	-.02	-.07	-.08	.04	-.07	-.07	-.66	-.02	-.21	-.0004	-.01	.08					
OTHER	.09	.00	-.12	-.12	.003	.0007	-.0006	-.12	-.0024	-.03	-.0006	-.001	-.0024	.03				
WHITE	-.13	.02	.2	.21	-.04	.07	.07	.78	.02	.24	.001	.02	-.08	-.02	.1			
RELINT	-1.01	.03	.86	.89	.08	-.02	-.01	-.67	-.01	-.75	-.03	.01	.01	.00	-.01	.24		
RUNEM	-.49	-.001	-.11	-.12	.00	-.02	-.02	-.19	-.01	-.03	.01	-.0006	.0006	.00	.00	.00	.02	
HRSSP	55.2	-.09	-131.	-119.54	-4.7	11.77	16.7	111.16	2.22	-32.24	-3.85	.02	.06	.08	-.14	-.16	-.11	541.33

Table 5.1

Dependent Variable: HRSR
Method: Least Squares
Date: 03/11/02 Time: 18:34
Obs: 4606 35283 IF YEAR > 1974 YEAR < 1999
AND MARRIED = 1
Included observations: 14884 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
HAPM	-0.491924	0.249647	-1.970478	0.049
AGE	0.719254	0.066511	10.81409	0
AGE_SQ	-0.011165	0.000622	-17.93754	0
AGESP	-0.026377	0.024782	-1.064329	0.287
CHILDS	-0.61344	0.091292	-6.71953	0
EDR	0.074353	0.059248	1.254941	0.21
FAMINC	-0.20959	0.011487	-18.24503	0
FAMINC_L	5.811557	0.401651	14.46916	0
FINRELA	0.440316	0.188202	2.339595	0.019
INC	0.462135	0.009742	47.43785	0
MALE	10.86538	0.375914	28.90392	0
BLACK	2.168467	0.512466	4.231436	0
OTHER	1.221637	0.874307	1.397262	0.162
RUNEMP	-31.50583	1.022324	-30.81786	0
HRSSP	0.065562	0.007399	8.860447	0
ROCCCLE	1.251241	0.449915	2.781058	0.005
ROCCCRA	1.564143	0.525141	2.978517	0.003
ROCCFAR	5.480245	0.96593	5.673546	0
ROCCMAN	4.587398	0.433217	10.58913	0
ROCCOPE	2.348529	0.553499	4.243062	0
ROCCSER	2.049958	0.516843	3.966308	1E-04
ROCCTRA	2.80162	0.65462	4.279768	0
YEAR	0.120954	0.049487	2.444167	0.015
GDPDEFL	-0.408351	0.136031	-3.001899	0.003
UNEMPRA	-0.023168	0.123707	-0.187281	0.851
C	-244.9276	99.04672	-2.472849	0.013

R-squared	0.463176	Mean dependent va	26.41
Adjusted R	0.462273	S.D. dependent var	23.22
S.E. of reg	17.0295	Akaike info criterion	8.51
Sum squar	4308875	Schwarz criterion	8.523
Log likelihc	-63301.82	F-statistic	512.8
Durbin-Wa	1.94533	Prob(F-statistic)	0

Table 5.2

Dependent Variable: HRSR
Method: ML - Censored Normal (TOBIT)
Date: 03/11/02 Time: 18:34
Obs: 4606 35283 IF YEAR > 1974 YEAR < 1999
AND MARRIED = 1

Left censoring (value) at zero

	Coefficient	Std. Error	z-Statistic	Prob.
HAPM	-0.440441	0.395754	-1.11292	0.266
AGE	2.076663	0.119018	17.44838	0
AGE_SQ	-0.028183	0.001192	-23.6531	0
AGESP	-0.074298	0.03883	-1.91342	0.056
CHILDS	-1.138563	0.151181	-7.53115	0
EDR	0.244289	0.096216	2.53895	0.011
FAMINC	-0.38862	0.01926	-20.1773	0
FAMINC_L	11.79874	0.709992	16.61813	0
FINRELA	0.826235	0.298066	2.771985	0.006
INC	0.641742	0.015404	41.66023	0
MALE	13.98479	0.59415	23.5375	0
BLACK	3.66933	0.803329	4.567656	0
OTHER	1.684669	1.350824	1.247142	0.212
HRSSP	0.115622	0.011673	9.905116	0
ROCCCLE	3.435756	0.726877	4.726736	0
ROCCCRA	3.09982	0.829803	3.735608	2E-04
ROCCFAR	10.65032	1.545461	6.891355	0
ROCCMAN	7.869785	0.67975	11.57748	0
ROCCOPE	3.553229	0.903256	3.933801	1E-04
ROCCSER	5.708306	0.834887	6.837217	0
ROCCTRA	4.135458	1.02967	4.016294	1E-04
YEAR	0.156321	0.078593	1.988992	0.047
GDPDEFL	-0.664034	0.216517	-3.06688	0.002
UNEMPRA	-0.128173	0.195914	-0.65423	0.513
C	-366.0034	157.3052	-2.32671	0.02

Error Distribution

SCALE:C(2	24.84496	0.196664	126.332	0

R-squared	0.400948	Mean dependent va	26.41
Adjusted R	0.39994	S.D. dependent var	23.22
S.E. of reg	17.98945	Akaike info criterion	6.356
Sum squar	4808353	Schwarz criterion	6.369
Log likelihc	-47272.34	Hannan-Quinn criter	6.36
Avg. log lik	-3.176051		

Left censor	5491	Right censored obs	0
Uncensore	9393	Total obs	14884

Table 6.1

Dependent Variable: HAPM
Method: Least Squares
Date: 03/11/02 Time: 18:42
Obs: 4606 35283 IF YEAR > 1974 AND YEAR < 1999
AND MARRIED = 1
Included observations: 14791 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
AGE	-0.00765	0.002178	-3.511918	4E-04
AGE_SQ	0.000115	2.04E-05	5.619107	0
AGESP	-0.002368	0.00081	-2.924793	0.004
CHILDS	-0.016105	0.002998	-5.371252	0
EDR	0.010241	0.002226	4.601329	0
FAMINC	0.000318	0.000376	0.846585	0.397
FAMINC_L	0.011581	0.013183	0.878486	0.38
FINRELA	0.01129	0.00615	1.835727	0.066
INC	-0.000216	0.00032	-0.676747	0.499
MALE	0.076151	0.012307	6.187479	0
BLACK	-0.197119	0.016911	-11.65637	0
OTHER	0.000928	0.028632	0.032403	0.974
RUNEMP	-0.028358	0.033295	-0.851724	0.394
HRSSP	0.000252	0.000242	1.041395	0.298
RELINT	0.128163	0.009548	13.42319	0
PARTOG	0.026935	0.01103	2.442024	0.015
ED_DIF	-0.012682	0.002016	-6.289855	0
ROCCCLE	0.030821	0.014675	2.100169	0.036
ROCCCRA	0.005313	0.017154	0.309734	0.757
ROCCFAR	-0.016617	0.031514	-0.527295	0.598
ROCCMAN	0.015503	0.01414	1.096458	0.273
ROCCOPE	-0.007299	0.018145	-0.402235	0.688
ROCCSER	-0.006604	0.016906	-0.390633	0.696
ROCCTRA	-0.004623	0.021414	-0.215878	0.829
YEAR	-0.000441	0.001618	-0.272761	0.785
GDPDEFL	0.00927	0.004442	2.086844	0.037
UNEMPRA	-0.001233	0.004043	-0.305107	0.76
C	3.349676	3.237783	1.034558	0.301

R-squared	0.041414	Mean dependent va	2.597
Adjusted R	0.039661	S.D. dependent var	0.566
S.E. of regı	0.554261	Akaike info criterion	1.66
Sum squar	4535.269	Schwarz criterion	1.674
Log likelihc	-12245.04	F-statistic	23.62
Durbin-Wa	1.929513	Prob(F-statistic)	0

Table 6.2

Dependent Variable: HRSR
Method: Least Squares
Date: 03/11/02 Time: 18:42
Obs: 4606 35283 IF YEAR > 1974 YEAR < 1999
AND MARRIED = 1

Variable	Coefficient	Std. Error	t-Statistic	Prob.
H_HAT	-6.021907	2.010768	-2.99483	0.003
AGE	0.696365	0.068395	10.18149	0
AGE_SQ	-0.010738	0.000665	-16.1352	0
AGESP	-0.03874	0.025287	-1.53203	0.126
CHILDS	-0.703046	0.096671	-7.27254	0
EDR	0.097673	0.060371	1.617872	0.106
FAMINC	-0.207458	0.011554	-17.9554	0
FAMINC_L	5.926653	0.405318	14.62222	0
FINRELA	0.468876	0.190621	2.459723	0.014
INC	0.457501	0.009813	46.62038	0
MALE	11.29101	0.400441	28.19647	0
BLACK	1.112092	0.635269	1.750583	0.08
OTHER	1.126823	0.879527	1.28117	0.2
RUNEMP	-31.80486	1.025816	-31.0045	0
HRSSP	0.066233	0.007463	8.875194	0
ROCCCLE	1.341811	0.455315	2.946996	0.003
ROCCCRA	1.518937	0.52676	2.883546	0.004
ROCCFAR	5.338101	0.968185	5.513511	0
ROCCMAN	4.606902	0.434889	10.59328	0
ROCCOPE	2.269711	0.557408	4.071902	0
ROCCSER	1.926157	0.51993	3.704647	2E-04
ROCCTRA	2.642368	0.658143	4.014886	1E-04
YEAR	0.118827	0.049652	2.393182	0.017
GDPDEFL	-0.361876	0.137457	-2.63264	0.009
UNEMPRA	-0.006579	0.124162	-0.05299	0.958
C	-226.7557	99.63268	-2.27592	0.023

R-squared	0.463084	Mean dependent va	26.46
Adjusted R	0.462175	S.D. dependent var	23.22
S.E. of regı	17.02769	Akaike info criterion	8.509
Sum squar	4280997	Schwarz criterion	8.523
Log likelihc	-62904.64	F-statistic	509.4
Durbin-Wa	1.940905	Prob(F-statistic)	0

Table 7.1

Dependent Variable: HAPMBIN2
Method: ML - Binary Probit (Quadratic hill climbing)
Date: 03/11/02 Time: 18:58
Sample(adjusted): 4606 35283 IF YEAR > 1974 AND YE/
AND MARRIED = 1
Included observations: 9727 after adjusting endpoints
Convergence achieved after 10 iterations
Covariance matrix computed using second derivatives

Variable	Coefficient	Std. Error	z-Statistic	Prob.
AGE	-0.037893	0.012708	-2.981719	0.003
AGE_SQ	0.000535	0.00013	4.124814	0
AGESP	-0.00715	0.004171	-1.714426	0.087
CHILDS	-0.037299	0.015305	-2.436985	0.015
EDR	0.037317	0.011544	3.232485	0.001
FAMINC	-0.002197	0.00187	-1.174641	0.24
FAMINC_L	0.130673	0.058878	2.219382	0.027
FINRELA	0.037196	0.031794	1.169903	0.242
INC	-0.00273	0.001723	-1.584208	0.113
MALE	0.382437	0.067109	5.698776	0
BLACK	-0.57344	0.073411	-7.811364	0
OTHER	-0.206355	0.133537	-1.545299	0.122
RUNEMP	-0.18022	0.156329	-1.152829	0.249
HRSSP	0.002087	0.00128	1.630606	0.103
RELINT	0.252836	0.052338	4.830877	0
PARTOG	0.134465	0.055388	2.427707	0.015
ED_DIF	-0.040085	0.010489	-3.821536	1E-04
ROCCCLE	0.175544	0.079873	2.19778	0.028
ROCCCRA	0.164776	0.101074	1.630243	0.103
ROCCFAR	0.288603	0.215785	1.337452	0.181
ROCCMAN	0.031758	0.075647	0.419816	0.675
ROCCOPE	0.022256	0.09073	0.245301	0.806
ROCCSER	-0.002063	0.083035	-0.024849	0.98
ROCCTRA	-0.022904	0.10946	-0.209246	0.834
YEAR	0.00267	0.008635	0.309239	0.757
GDPDEFL	0.012849	0.023609	0.544245	0.586
UNEMPRA	-0.005843	0.021642	-0.269994	0.787
C	-3.926685	17.27421	-0.227315	0.82

Mean depe	0.960728	S.D. dependent var	0.194
S.E. of regr	0.190739	Akaike info criterion	0.31
Sum squar	352.8645	Schwarz criterion	0.331
Log likelihc	-1480.916	Hannan-Quinn criter	0.317
Restr. log l	-1611.025	Avg. log likelihood	-0.152
LR statistic	260.218	McFadden R-square	0.081
Probability(	0		

Obs with D	382	Total obs	9727
Obs with D	9345		

Table 7.2

Dependent Variable: HRSR
Method: ML - Censored Normal (TOBIT)
Date: 03/11/02 Time: 19:05
Obs: 4606 35283 IF YEAR > 1974 YEAR < 1999
AND MARRIED = 1

Left censoring (value) at zero
Convergence achieved after 9 iterations

	Coefficient	Std. Error	z-Statistic	Prob.
H_HATBIN	-1.414268	0.019213	-73.6095	0
AGE	1.747983	0.0965	18.11385	0
AGE_SQ	-0.023925	0.000966	-24.7616	0
AGESP	-0.084368	0.031491	-2.67913	0.007
CHILDS	-1.038942	0.123433	-8.41708	0
EDR	0.141069	0.07855	1.795905	0.073
FAMINC	-0.367496	0.015649	-23.4831	0
FAMINC_L	10.99868	0.57889	18.9996	0
FINRELA	0.794239	0.242091	3.280749	0.001
INC	0.633349	0.012556	50.44339	0
MALE	13.64298	0.482217	28.29223	0
BLACK	2.325506	0.656298	3.543371	4E-04
OTHER	1.97199	1.102168	1.79E+00	0.074
HRSSP	0.120805	0.009515	12.69562	0
ROCCCLE	2.383215	0.592516	4.022193	1E-04
ROCCCRA	2.123621	0.673454	3.153327	0.002
ROCCFAR	6.72215	1.261055	5.330577	0
ROCCMAN	7.260704	0.551362	13.16866	0
ROCCOPE	3.002543	0.73844	4.06606	0
ROCCSER	5.012133	0.681985	7.349335	0
ROCCTRA	2.745037	0.836862	3.280154	0.001
YEAR	0.172518	0.063828	2.702835	0.007
GDPDEFL	-0.48372	0.175755	-2.75225	0.006
UNEMPRA	-0.042603	0.159081	-0.26781	0.789
C	-389.3722	127.7456	-3.04803	0.002
SCALE:C(2	19.85228	0.155188	127.9244	0

R-squared	0.584003	Mean dependent va	26.46
Adjusted R	0.583299	S.D. dependent var	23.22
S.E. of regr	14.98813	Akaike info criterion	6.016
Sum squar	3316868	Schwarz criterion	6.029
Log likelihc	-44463.28	Hannan-Quinn criter	6.02
Avg. log lik	-3.006104		

Left censor	5439	Right censored obs	0
Uncensore	9352	Total obs	14791

Table 8.1

Dependent Variable: HWRKR2
Method: Least Squares
Date: 03/11/02 Time: 19:05
Sample(adjusted): 29391 35282 IF (YEAR > 1993 AND YEAR < 1997)
AND MARRIED = 1 AND HAPM > 0
Included observations: 1895 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
HAPM	-0.600869	0.38724	-1.551672	0.121
AGE	-0.049607	0.105217	-0.471472	0.637
AGE_SQ	0.000961	0.000985	0.976216	0.329
AGESP	-0.032535	0.040945	-0.794594	0.427
CHILDS	0.341784	0.152742	2.237657	0.025
EDR	0.00573	0.093473	0.061303	0.951
FAMINC	0.022094	0.016929	1.305098	0.192
FAMINC_L	-0.245961	0.642817	-0.38263	0.702
FINRELA	-0.148066	0.277321	-0.533917	0.594
INC	-0.024757	0.013512	-1.832202	0.067
MALE	-4.717272	0.524946	-8.986208	0
BLACK	-1.486726	0.792835	-1.875203	0.061
OTHER	1.167927	1.042949	1.119832	0.263
RUNEMP	-0.542448	1.642365	-0.330284	0.741
HRSSP	0.02721	0.010871	2.503049	0.012
ROCCCLE	0.237038	0.678439	0.349388	0.727
ROCCCRA	-1.158866	0.836744	-1.38497	0.166
ROCCFAR	-2.181214	1.562591	-1.395896	0.163
ROCCMAN	-0.53027	0.679598	-0.78027	0.435
ROCCOPE	0.628828	0.963205	0.652849	0.514
ROCCSER	-0.366259	0.761242	-0.481133	0.631
ROCCTRA	-0.689505	0.96704	-0.713006	0.476
C	14.99645	3.064241	4.894018	0

R-squared	0.105319	Mean dependent va	10.17
Adjusted R	0.094805	S.D. dependent var	9.376
S.E. of regı	8.920128	Akaike info criterion	7.227
Sum squar	148952.6	Schwarz criterion	7.294
Log likelihc	-6824.166	F-statistic	10.02
Durbin-Wa	1.715038	Prob(F-statistic)	0

Table 9.1

Dependent Variable: HAPM
Method: Least Squares
Date: 03/11/02 Time: 19:05
Sample(adjusted): 29391 35283 IF (YEAR > 1993 AND Y
AND MARRIED = 1 AND HAPM > 0
Included observations: 2487 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
AGE	-0.015105	0.005297	-2.851899	0.004
AGE_SQ	0.000155	5.06E-05	3.070754	0.002
AGESP	0.001423	0.001751	0.812355	0.417
CHILDS	-0.01872	0.007852	-2.384116	0.017
EDR	0.005265	0.005547	0.949166	0.343
FAMINC	-0.000246	0.000872	-0.281892	0.778
FAMINC_L	-0.009084	0.032782	-0.277098	0.782
FINRELA	0.027402	0.014142	1.937693	0.053
INC	-0.000256	0.000696	-0.368529	0.713
MALE	0.067545	0.026818	2.51867	0.012
BLACK	-0.275997	0.041064	-6.721209	0
OTHER	0.084243	0.052175	1.614632	0.107
RUNEMP	-0.120883	0.088506	-1.365817	0.172
HRSSP	0.000227	0.000564	0.40311	0.687
RELINT	0.101216	0.022221	4.555025	0
PARTOG	0.039261	0.025046	1.567528	0.117
ED_DIF	-0.012654	0.00483	-2.619819	0.009
ROCCCLE	0.003893	0.035737	0.108938	0.913
ROCCCRA	-0.087074	0.04235	-2.056041	0.04
ROCCFAR	-0.030315	0.082306	-0.368315	0.713
ROCCMAN	-0.030912	0.034841	-0.887214	0.375
ROCCOPE	0.006495	0.04936	0.131574	0.895
ROCCSER	-0.070727	0.039145	-1.8068	0.071
ROCCTRA	-0.030328	0.0489	-0.620212	0.535
C	2.726748	0.14691	18.56066	0

R-squared	0.050087	Mean dependent va	2.587
Adjusted R	0.040827	S.D. dependent var	0.539
S.E. of regı	0.527459	Akaike info criterion	1.569
Sum squar	684.9603	Schwarz criterion	1.627
Log likelihc	-1925.442	F-statistic	5.409
Durbin-Wa	1.987358	Prob(F-statistic)	0

Table 9.2

Dependent Variable: HWRKR2
Method: Least Squares
Date: 03/11/02 Time: 19:05
Obs: 29391 35282 IF YEAR > 1993 YEAR < 1997
AND MARRIED = 1 AND HAPM > 0

Variable	Coefficient	Std. Error	t-Statistic	Prob.
H_HAT	2.425868	3.462484	0.700615	0.484
AGE	-0.001016	0.116189	-0.00874	0.993
AGE_SQ	0.00047	0.001111	0.423421	0.672
AGESP	-0.0371	0.041412	-0.89586	0.37
CHILDS	0.389274	0.163941	2.374478	0.018
EDR	-0.001145	0.093947	-0.01219	0.99
FAMINC	0.021185	0.017113	1.237933	0.216
FAMINC_L	-0.183027	0.650219	-0.28149	0.778
FINRELA	-0.233529	0.294667	-0.79252	0.428
INC	-0.023707	0.013683	-1.73257	0.083
MALE	-4.77671	0.572362	-8.34561	0
BLACK	-0.643218	1.224681	-0.52521	0.6
OTHER	0.829263	1.098493	0.754909	0.45
RUNEMP	-0.142301	1.714372	-0.083	0.934
HRSSP	0.027663	0.010983	2.518805	0.012
ROCCCLE	0.229479	0.679582	0.337677	0.736
ROCCCRA	-0.938453	0.903643	-1.03852	0.299
ROCCFAR	-2.092147	1.57178	-1.33107	0.183
ROCCMAN	-0.475649	0.69384	-0.68553	0.493
ROCCOPE	0.660409	0.966821	0.683073	0.495
ROCCSER	-0.103598	0.81037	-0.12784	0.898
ROCCTRA	-0.769117	0.982243	-0.78302	0.434
C	6.228526	10.17273	0.612277	0.54

R-squared	0.102422	Mean dependent va	10.18
Adjusted R	0.091811	S.D. dependent var	9.364
S.E. of regı	8.924246	Akaike info criterion	7.228
Sum squar	148214.1	Schwarz criterion	7.295
Log likelihc	-6785.356	F-statistic	9.653
Durbin-Wa	1.718174	Prob(F-statistic)	0

Table 10.1

Dependent Variable: HAPMBIN2
Method: ML - Ordered Probit (Quadratic hill climbing)
Date: 03/11/02 Time: 19:05
Sample(adjusted): 29391 35283 IF (YEAR > 1993 AND Y
AND MARRIED = 1 AND HAPM > 0
Included observations: 1577 after adjusting endpoints
Number of ordered indicator values: 2
Convergence achieved after 6 iterations
Covariance matrix computed using second derivatives

	Coefficient	Std. Error	z-Statistic	Prob.
AGE	-0.071171	0.03887	-1.831021	0.067
AGE_SQ	0.000755	0.000402	1.879889	0.06
AGESP	0.009772	0.013269	0.736466	0.461
CHILDS	-0.043241	0.047103	-0.918007	0.359
EDR	0.013584	0.033628	0.403952	0.686
FAMINC	-0.000301	0.005599	-0.053694	0.957
FAMINC_L	-0.080416	0.215556	-0.373066	0.709
FINRELA	0.038571	0.088756	0.434577	0.664
INC	-0.003484	0.004215	-0.826539	0.409
MALE	0.39058	0.16998	2.297801	0.022
BLACK	-0.823008	0.197154	-4.174438	0
OTHER	-0.232223	0.26029	-0.892169	0.372
RUNEMP	-0.09269	0.554713	-0.167096	0.867
HRSSP	-1.82E-05	0.003471	-0.005251	0.996
RELINT	0.056658	0.131698	0.430211	0.667
PARTOG	0.273508	0.136199	2.008147	0.045
ED_DIF	-0.077014	0.028816	-2.672597	0.008
ROCCCLE	-0.134791	0.212659	-0.633835	0.526
ROCCCR/	-0.387018	0.258204	-1.498886	0.134
ROCCFAR	6.003197	811179.2	7.40E-06	1
ROCCMAN	-0.181637	0.202146	-0.89854	0.369
ROCCOPE	-0.206078	0.275787	-0.747236	0.455
ROCCSER	-0.281434	0.230509	-1.220925	0.222
ROCCTRA	-0.488685	0.268167	-1.822319	0.068
Limit Points				
LIMIT_1:C(	-2.981826	0.969143	-3.076764	0.002

Akaike info	0.318775	Schwarz criterion	0.404
Log likelihc	-226.3544	Hannan-Quinn criteı	0.35
Restr. log l	-251.7411	Avg. log likelihood	-0.144
LR statistic	50.7733	LR index (Pseudo-F	0.101
Probability(	0.001128		

Table 10.2

Dependent Variable: HWRKR2
Method: Least Squares
Date: 03/11/02 Time: 19:14
Obs: 29391 35282 IF YEAR > 1993 YEAR < 1997
AND MARRIED = 1 AND HAPM > 0

Variable	Coefficient	Std. Error	t-Statistic	Prob.
H_HATBIN	-0.433845	0.426187	-1.01797	0.309
AGE	-0.059769	0.128053	-0.46675	0.641
AGE_SQ	0.000947	0.001191	0.795574	0.426
AGESP	-0.037548	0.050531	-0.74306	0.458
CHILDS	0.701471	0.190708	3.678236	2E-04
EDR	0.070404	0.114056	0.617281	0.537
FAMINC	0.01696	0.021041	0.806047	0.42
FAMINC_L	-0.404214	0.806599	-0.50113	0.616
FINRELA	-0.216151	0.355758	-0.60758	0.544
INC	-0.026411	0.017	-1.55359	0.121
MALE	-4.095489	0.653899	-6.26319	0
BLACK	-1.255691	1.166499	-1.07646	0.282
OTHER	1.172615	1.211709	0.967736	0.333
RUNEMP	-0.209978	2.223063	-0.09445	0.925
HRSSP	0.039908	0.013582	2.938409	0.003
ROCCCLE	0.200619	0.818042	0.245243	0.806
ROCCCR/	-0.95059	1.033978	-0.91935	0.358
ROCCFAR	-0.912268	1.994158	-0.45747	0.647
ROCCMAN	-0.937296	0.825641	-1.13523	0.257
ROCCOPE	0.359373	1.165218	0.308417	0.758
ROCCSER	-0.862195	0.971505	-0.88749	0.375
ROCCTRA	-1.788949	1.182313	-1.51309	0.131
C	13.26063	3.557131	3.727901	2E-04

R-squared	0.107586	Mean dependent va	10.03
Adjusted R	0.090661	S.D. dependent var	9.135
S.E. of regı	8.711088	Akaike info criterion	7.186
Sum squar	88024.34	Schwarz criterion	7.285
Log likelihc	-4227.709	F-statistic	6.357
Durbin-Wa	1.845548	Prob(F-statistic)	0