Labor Supply, Wealth Dynamics, and Marriage Decisions*

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First Draft July 2005, Current Draft December 2013
Preliminary

Abstract

Using the Panel Study of Income Dynamics (PSID), we provide evidence that labor supply, household production, savings, and marital decisions are linked. We then develop and estimate a model that has the ability to generate the patterns observed in the data. Using the estimated model we first show that it is important to consider the link between labor supply, household production, wealth, and marriage choices to understand household behavior and its response to policy changes. We then use the model to evaluate the effect of the Earned Income Tax Credit (EITC) and other subsidy programs on individual decisions and welfare.

*We are very grateful to Moshe Buchinsky, Pierre-André Chiappori, Lucas Davis, James Heckman, Joseph Hotz, John Kennan, James Walker, Victor Rios-Rull, Duncan Thomas, and participants at SITE, the Econometric Society World Congress, the Minnesota Applied Micro Workshop, the Queen's University Quantitative Economics Workshop, UCLA, and the Conference on Households, Gender and Fertility at UC Santa Barbara for their helpful comments. Mazzocco thanks the National Science Foundation for Grant SES-0519276, and the Academic Technology Services at UCLA and the San Diego Supercomputer Center for the use of their computer clusters.

1 Introduction

Many of the policies discussed by policy makers and economists affect the decisions and welfare of individuals and of the households in which they live. The most common examples are changes to the tax code or changes to programs for low-income families such as the Earned Income Tax Credit (EITC), unemployment benefits, or food stamp programs. To evaluate whether these changes are socially beneficial, it is important that economists and policy makers understand their effect on individual and household decisions.

The first contribution of this paper is to show empirically that different types of household decisions, namely labor supply, household production, savings, and marital decisions, are interconnected. As a consequence, to evaluate the effect of a particular policy on individual decisions and welfare, economists and policy makers should not consider its impact on one type of decision at a time, but rather on all of them simultaneously. Specifically, using the Panel Study of Income Dynamics (PSID), we find that households display large differences in labor supply, savings, and time devoted to household production by marital status. Married men work on average about 200 hours more than single men, who work 200 hours more than single women, whose labor hours exceed the labor hours of married women by about 200 hours. The same ranking applies to labor force participation. Married men have the highest participation rate, followed by single men, single women, and married women. The ranking for household production is reversed. Married women spend the highest number of hours in household production at 1287 annual hours. They are followed by single women with 604 annual hours, single men with 372 hours, and married men with 366 hours. Households display large differences by marital status also with respect to savings decisions. In the PSID, married couples on average have more than four times the wealth of individuals who are single and more than twice the wealth of married couples that will experience a divorce in the following year.

In the paper, we provide evidence that the differences between married and single individuals in labor supply and household production observed in the PSID data do not arise suddenly at the time of marriage, but rather emerge gradually over time. To document this pattern, we study the evolution of these variables for women and men who experience a marriage or a divorce. We show that, before women choose to marry, they supply on average the same amount of labor hours as the average single woman. Starting from two years before marriage, however, they begin to gradually reduce their labor hours. At the time of marriage, their labor supply is about 200 hours lower than the average single woman and about 300 hours higher than the average married woman. The labor supply of women who experience this transition into marriage continue to decline until after 4-5 years of marriage it reaches the level of the average married woman. The labor supply of men who enter marriage displays a similar transition but with a positive trend. Prior to marriage, they supply the same amount of labor hours as the average single man. Beginning from two years before marriage, this group of men starts to increase their labor supply. At the time of marriage, their labor supply is about 150 hours larger than the average labor supply of single men and about 100 hours less than the average married man. After they enter marriage, their labor supply continues to increase until the fourth year of marriage when it reaches the level of the average married man. As an additional result, we provide evidence that when women transition into fewer labor hours, they adjust accordingly the time they spend in household production. Specifically, the year before marriage, women start to increase the number of hours they devote to household production from the level supplied by the average unmarried woman. The rise in hours then continues until after five years of marriage it converges to the amount supplied by the average married women.

The transition of married couples into divorce is also characterized by significant changes in labor supply and time spent in household production. Well before a divorce occurs, married households start reducing the degree of intra-household specialization. The changes affect mostly women. Their labor supply begins to increase three years before a divorce is observed and keeps increasing until the first year after divorce when it reaches the level that characterizes the average single woman. Men do not change their labor supply before a divorce, but adjust the number of labor hours after the event. Three years after a divorces, the average men supplies the same amount of labor hours as the average single man.

The evidence provided in the first part of the paper indicates that to understand the effect of policy interventions on household decisions and individual welfare, one has to take into account the relationship between different aspects of household behavior. Most studies that analyze household decisions ignore this relationship and focus on a subset of household choices. The main goal of the second part of the paper is to develop a model that considers simultaneously labor supply, household production, savings, and marital decisions. A model that can therefore be used to evaluate the benefits and costs of the many policies that have an impact on individual welfare.

In the model that we propose, individuals who are single meet potential spouses and decide whether to marry. Married couples make decisions cooperatively, in the sense that they are efficient. But, given that non-consensual divorces are frequent in the U.S. data, we do not allow them to commit to future allocations of resources. A couple divorces when the marriage no longer generates a positive surplus and therefore both spouses are better off as single. The inability of spouses to commit implies that the relative decision power of each household member varies with changes in their outside options. This has two main implications. First, saving decisions and decisions related to labor hours and time spent in household production change over time not only because of variation in interest rates and wages, but also because of changes in the relative intra-household decision power. Second, savings and time allocation decisions affect the individual outside options and therefore the individual decision power.

In this environment, labor supply takes on added importance. For married individuals, working increases human capital, and hence the individual decision power within the family, and the expected future utility of divorce. For unmarried individuals, human capital increases current and future earnings, making them more attractive to potential spouses and thus increasing their decision power in case of marriage. These dynamics have the potential of explaining some of the patterns in labor supply observed in the data. Individuals increase labor supply prior to marriage in order to become attractive to potential spouses and to secure decision power within the marriage. Then, during marriage, spouses choose individual labor supply according to individual wages and decision power. Finally, when a couple faces high divorce probabilities, the woman responds by increasing her labor supply in order to prepare for the possibility of becoming single again.

In the model we propose, households have an additional saving motive as well, which interacts with the life-cycle and precautionary motives for saving. This additional motive for wealth accumulation may help explain some of the observed patterns for savings during marital transitions. Married couples increase savings during marriage because of traditional saving motives. These motives are generally mitigated in marriages facing high divorce probabilities. In these households the spouse with high decision power has additional incentives to consume because at divorce existing laws tend to distribute resources equally or equitably, whereas consumption during marriage is allocated according to the individual decision power.

The model is estimated using data from the 1984-1996 waves of the PSID. The sample is restricted to include the cohort of individuals that are between the ages of 22 and 32 in 1984. This restriction is imposed to reduce the heterogeneity of the sample and because most of the changes in marital status occur early in life. The results indicate that the proposed model can match many of the features observed in the data. We can explain the differences in labor supply and household production between married and single agents, and between men and women. We can also explain a significant part of the variation in labor supply and household production before and after a change in marital status.

In the last part of the paper, we use the estimated model to evaluate different subsidy programs for low-income families. We provide evidence that the EITC introduces disincentives in labor supply. We also show that the EITC program can be improved in a way that reduces the effects of those disincentives and increases the individual welfare.

This paper is related to the literature on the collective representation of household behavior. Manser and Brown (1980) and McElroy and Horney (1981) are the first papers to characterize the household as a group of agents making joint decisions. In those papers the household decision process is modeled by employing a Nash bargaining solution. Chiappori (1988) and Chiappori (1992) extend their model to allow for any type of efficient decision process. The theoretical model used in the present paper is a generalization of the static collective model introduced by Chiappori to an intertemporal framework without commitment. The static collective model has been extensively tested and estimated. Thomas (1990) is one of the first papers to test the static unitary model against the static collective model. Browning et al. (1994) perform a similar test and estimate the intra-household allocation of resources. Chiappori, Fortin, and Lacroix (2002) analyze theoretically and empirically the impact of the marriage market and divorce legislations on household labor supply using a static collective model. Blundell et al. (2007) develop and estimate a static collective labor supply framework which allows for censoring and nonparticipation in employment. Donni (2004) shows that different aspects of a static collective model can be identified and estimated.

This paper also contributes to a growing literature which attempts to model and estimate the intertemporal aspects of household decisions using a collective formulation. Lundberg, Startz, and Stillman (2003) use a collective model with no commitment to explain the consumption-retirement puzzle. Guner and Knowles (2003) simulate a model in which marital formation affects the distribution of wealth in the population. van der Klaauw and Wolpin (2008) formulate and estimate a model of retirement and saving decisions of elderly couples who make efficient decisions. Duflo and Udry (2004) study the resource allocation and insurance within households using data from Côte D'Ivoire. Rios-Rull, Short, and Regalia (2010) develop a model in which men and women make marital status, fertility, and investment in children decisions conditional on the available wage distribution. The model is then used to explain the large increase in the share of single women and single mothers between the mid seventies and the early nineties. Mazzocco (2004) analyzes the effect of risk sharing on household decisions employing a full-commitment model. Mazzocco (2007) tests three models: the intertemporal unitary model, the full-commitment intertemporal collective model, and the no-commitment collective model. The data reject the first two models in favor of the no-commitment model. Tartari (2007) employs a dynamic model of the household to evaluate the effect of divorce on the cognitive ability of children. Casanova (2010) is one of the first papers to study retirement decisions as the joint decision of husband and wife using a collective model of the household with commitment. Gemici (2011) analyzes migration family choices when both spouses are involved in the decision process. Gemici and Laufer (2011) consider the effect of cohabitation on future household decisions and individual welfare using a no-commitment model of the household similar to the one considered here. Voena (2011) evaluates the effect of changes in divorce laws in the late sixties and early seventies on labor supply of single and married individuals using a framework similar to the one employed in this paper. Fernandez and Wong (2011) attempt to explain the larger increase in labor force participation of women in the second half of the twentieth century using a dynamic model of household decisions.

Many papers have analyzed labor supply decisions by gender and marital status. For instance, Heckman and Macurdy (1980) estimate a life cycle model of labor supply decisions of married females. Jones, Manuelli, and McGrattan (2003) and Olivetti (2006) study the large increase in labor supply of married women in the United States in the second half of the twentieth century. Andres, Fuster, and Restuccia (2005) document gender differences in wages, employment and hours of work during the life cycle. They use a model with fertility decision and human capital accumulation to rationalize the empirical patterns. The present paper is, however, one of the first attempts to estimate a model of labor supply decisions that considers the transitions in and out of marriage.

The paper proceeds as follows. The next section documents the patterns observed in the PSID. Sections 3 and 4 describe the no-commitment intertemporal collective model. Sections 5 and 6 explain how the model is estimated and present the results. In section 7, we describe a set of policy evaluations. Section 8 concludes.

2 Empirical Evidence

This section presents empirical evidence which indicates that labor supply, household production, savings, and marital decisions are related. The discussion is based on data from the Panel Study of Income Dynamics (PSID). The PSID is well suited to analyze the relationship between labor supply, saving, and marital decisions for two reasons. First, the PSID has gathered individual-level data on labor supply, time spent on household production, and marital status annually each spring since 1968 and data on household wealth every four years starting in 1984. Second, since the PSID is a true panel that follows the same households and their split-offs over time, the dataset can be used to examine the dynamics of household decisions.

Table 1 summarizes some of the household decisions made by unmarried females, married females, unmarried males, and married males. The sample covers the period 1968-1996 and is restricted to include individuals between the ages of 20 and 40. The latino and immigrant samples are excluded from the analysis. These restrictions are used to reduce the heterogeneity in the sample and because most of the changes in marital status occur at young ages.

Table 1 displays some features of household behavior that are worth discussing. First, there is a clear pattern by gender and marital status in labor supply behavior: married men work more than unmarried men, who work more than umarried women, who choose to supply more hours than married women. Specifically, conditional on working, unmarried females supply on average about 200 more hours a year than married females. The annual labor supply of unmarried men is lower than the labor supply of married men by slightly more than 200 hours. Both unmarried and married women supply fewer hours on the labor market than men. Second, labor force participation of single men is only 2% lower than labor force participation of married men which is equal to 98%. Unmarried women are five percentage points less likely to work than unmarried men. As expected, married women are less likely to work in the labor market with a participation rate of 66%. Hours spent on household production display a pattern that is consistent with the data on labor supply: the individuals that supply longer labor hours devote less time to household production. Married women are the top of the ranking with 1287 annual hours, followed by single women with 604. Next in the ranking we find single men with 372 hours and, in the last position, married men who devote about the same amount of hours to household production as single men at 366.

The numbers in Table 1 give a static picture of the relationship between labor supply, household production, and marriage decisions. To provide a more dynamic description of the link among these decisions, we now describe the evolution of labor supply and household production decisions around the time a couple chooses to marry. Figures 1-6 describe labor supply decisions as individuals enter marriage relative to two baseline comparison groups: married individuals and single individuals. An index is used where 0 denotes the first year of a transition between marital states. The index -t indicates the t-th year prior to the transition and t indicates the t-th year after the transition. These marriages occur during different years in the sample for different individuals. In some cases particular observations will not be available for particular individuals. For example, an observation for three years prior to marriage will not be available for an individual who gets married in the second year of the sample. For this reason the number of observations will vary at different points in the index. To take this into account, we weight the baseline comparison groups to reflect the calendar year composition of the transition groups.

Figure 1 describes women's labor supply before and during marriage. During the transition, average annual labor supply falls from the average number of hours supplied by single women, around 1600, to the average amount of labor hours supplied by married women, around 1100 hours. This large decline begins two years prior to marriage and continues many years into the marriage. Figures 3 and 5 describe similar patterns for labor supply conditional on working and labor force participation. Figure 2 reports the evolution of the same variables for men. The labor supply behavior of men shows a pattern similar to the one displayed by women, but with a trend that goes in the opposite direction. When women start decreasing their labor supply about two years before marriage, men begin to increase their labor hours. They continue to increase the amount of labor hours until their fourth year of marriage when they reach the level of the average married man. During the transition men increase their labor supply by about 300 hours. Figures 4 and 6 display labor supply conditional on working and labor force participation for the same sample of men.

In the next two figures, we describe the evolution of the time spent on household production by women and men. Figure 7 shows that the large decline in labor supply of women around the year of marriage is accompanied by a similar increase in time devoted to household production. This rise starts the year before the woman marries and continues for the first five years of marriage. After the transition, women supply on average 600 more hours to household production than the average single woman. In Figure 8, we report the evolution of the same variable for men. Given that there is no difference in household production between single and married men, there is also no transition for this variable for men that enter a marriage.

One possible explanation for the changes in labor supply behavior around the time of marriage is that marriage proxies for the time of the first birth. To evaluate whether this is the case, in Figures 9 and 10 we show the evolution of labor supply of women and men before and after the first birth. The birth of the first child explains a significant fraction of the decline in labor supply of women before and during marriage. Their average labor supply decreases from about 1600 hours two years before the first birth to about 900 hours in the year of the first birth. The decline is explained by a drop in the number of hours conditional on working as well as by a reduction in labor force participation. Men display a different pattern. Their labor supply increases steadily starting three years before the birth of their first child and ending two years after the first child was born. The increase in labor supply is almost entirely explained by the increase in hours worked conditional on participation. Since the transition in the labor supply of men starts well before the birth of the first child and continues afterward, our results suggest that their transition in labor supply is not generated exclusively by a birth.

To determine whether for women the entire transition is explained by the birth of a child, Figure 11 depicts the labor supply decisions of women without children before and during marriage. This group of women displays a decrease in labor supply before and during marriage even if they do not have children. This last result implies that the variation in labor supply of women observed around marriage is not exclusively explained by children. We have also looked at the changes in labor supply decisions of men without children. Figure 12 indicates that for this selected sample there is no transition in labor supply.

To investigate the role of labor market experience and education on the decisions of women around the time of marriage, in figure 13 and 14 we graph the residuals obtained by regressing labor supply of women without children and men on education and on a polynomial of second order in experience. The objective is to understand whether accumulated human capital explains the variation in labor supply that is not explained by children. Accumulated human capital explains part of the observed changes in labor supply. However, for both women without children and men we still observe the labor supply transition discussed above.

The next set of figures studies the effect of divorce on labor supply and household production decisions. Figure 15 describes labor supply of women before and after divorce. Our results indicate that the intra-household specialization that is generated during marriage disappears in the years that precede a divorce. Specifically, five years before a divorce, women work on average the same amount of hours as the average married woman. Starting from three years before a divorce, however, women start to increase their labor supply. At the time of divorce, women supply about 400 labor hours more than the average married woman and about 150 hours less than the average single woman. Then one year after divorce, women going through this transition work as much as the average single woman. These results are consistent with the results presented in Johnson and Skinner (1986). Figure 16 describes the evolution of labor supply for men that experience a divorce. During marriage they work the same amount of hours as the average married man. It is only after divorce that they reduce their labor supply by about 200 hours.

In the next set of figures, we describe the evolution of household production before and after divorce. Figures 17 and 18 describe the amount of hours spent by women and men on household production before and after divorce. They show that the labor supply changes experienced by women are matched by changes in the amount of time they devote to household production. When women increase their market labor before a divorce, they reduce the time spent on household production by about the same amount. As a consequence their leisure remains roughly unchanged during this transition. In the figure for men there is nothing remarkable, which is not surprising given that there is no difference between the time spent on household production by married and single men.

We conclude this section with a discussion of the differences in wealth holding by marital status. Real estate values and the value of cars are excluded from our definition of wealth. Table 2 indicates that wealth levels vary with marital decisions. Married couples have on average more than four times the wealth of umarried individuals. This difference grows over time since at the time of marriage couples have slightly less than twice the wealth of unmarried individuals. It is also noteworthy that couples that will experience a divorce in one year have on average less than half the wealth level of married couples.

This section provides evidence that labor supply, household production, savings, and marriage decisions are related. Traditional studies of labor supply have focused on married individuals only or single individuals only, therefore ignoring the relationship among these variables. The rest of the paper is devoted to developing and estimating a model that can generate the link between labor supply, household production, wealth, and marital choices observed in the data.

3 The Model

In this section we develop a model that has the potential of generating the empirical patterns observed in the data. To explain those patterns, a model must be able to generate a type of intra-household specialization which has the following two features. First, the specialization starts before marriage and increases after the household has been formed. Second, the specialization decreases before a divorce. The empirical evidence suggests that the change over time in specialization is partially explained by the following two variables: the birth of children and by the accumulation of human capital. The data also indicate that there is a residual part of the evolution of specialization that these two variables cannot explain. The model should therefore include children, the evolution of human capital, and an additional source of specialization that can explain its residual component.

Specifically, we will consider a model with the following features. There are two types of individuals: women and men. Each one of them lives for T periods in an environment characterized by uncertainty, which is captures by the states of nature $\omega \in \Omega$. Each individual enters the period as married or single. If she is single, she draws from the population a potential spouse. They must then decide whether to get married. If she is married, her and her spouse must decide whether to stay married. In case of divorce, a cost D must be paid.

One can use different approaches to characterize the decision process of married individuals. The degree of intra-household specialization observed in the data suggests, however, that there is some level of cooperation in the majority of married households. We will therefore use a cooperative framework to represent their decision process. In a static framework, the cooperative model generally used is the collective model, whose main feature is the assumption that household decisions are efficient. When the collective model is extended to an intertemporal environment, a commitment issue arises. One can consider a model in which the married individuals can commit to future plans. In this case the individuals choose a contingent plan at the time of marriage and stick to it even if ex-post it would be optimal to renegotiate the initial agreement or divorce. As an alternative, one can consider a model with no commitment. In this case, the married individuals renegotiate the initial plan or divorce if it is optimal. It is equivalent to requiring that the contingent plan satisfies a set of participation constraints in each period and state of nature, i.e. the expected welfare of each individual if she stays married is greater than the expected welfare provide by the best outside option.[1] Mazzocco (2007) tests the full-commitment and the no-commitment intertemporal collective models. Using US data the full-commitment model is rejected, whereas the no-commitment model cannot be rejected. For this reason, we will characterize the decision

[1] The model used here builds on the approach developed in the no-commitment literature. See for example Marcet and Marimon (1992), Marcet and Marimon (1998), Kocherlakota (1996), Attanasio and Rios-Rull (2000) and Ligon, Thomas, and Worrall (2002), and Mazzocco (2007).

process of married households using an intertemporal collective model with no commitment. Since the cost of divorce in the US is generally low, we use divorce as the best outside option for married individuals. In the no-commitment model, the difference between the value of being married and the value of divorce for two married individuals characterizes the marital surplus or, equivalently, the gains from marriage. This variable plays an important role in our model since it affects the probability of divorce and hence every other decision of a married household.

To allow the degree of specialization to be affected by the birth of children, in the model, women give birth to children according to a fertility process that depend on their marital status and age. Specifically, we follow the data in assuming that the probability of giving birth increases if a woman is married and declines with her age. There is a cost P_t that a household has to pay to raise a child. In case of divorce the children spend $y\%$ of the time with the mother and the rest of the time with the father. Each individual is endowed with a given amount of time $\mathcal{T}$ which can be devoted to three different activities: market production, household production, and leisure. The time they spend on market production h_i is compensated at a wage rate w_i. Men and women draw wage offers from different probability distributions $f_j(w_i)$, where $j = f, m$. Married individuals will therefore specialize in market production or household production depending on their wage offer and the wage offer of the spouse.

Each household produces a good Q. The good represents the quality of the children present in a household and other goods that are produced within the household like meals and a cleanness. The inputs in the production of the good are hours of work and the number of children. Specifically, in married households $Q = f(n, d_w, d_m)$, where d_w and d_m denote the number of hours the wife and husband devote to domestic labor. In single households, $Q = f(n, d_i)$. In case of divorce, the number of children n is replace by yn in the mother's production function and by $(1-y)n$ in the father's production function, where y describes the fraction of time a child spends with the mother. It is important to remark that Q is a public good for married households and a private good for single households. As a consequence, Q increases the marital surplus of a married household. Individuals can choose freely the amount of domestic labor to devote to households production as long as it is above a threshold that represents the minimum amount that must be provided. The threshold is higher for married households and increases with the number of children.

We allow for two types of investment. First, individuals can save or borrow at a risk-free gross return R_t. Married households can only save jointly.[2] Second, individuals can accumulate human

[2]In a model with no-commitment, it may be optimal for household members to have individual accounts to improve their outside options. Note, however, that the only accounts that may have an effect on the reservation utilities are the ones that are considered as individual property during a divorce procedure. In the United States the fraction of wealth that is considered individual property during a divorce procedure depends on the state law. There are three different property laws in the United States: common property law, community property law, and equitable

capital whose stock HC_t has the effect of improving the probability distribution of wages. We assume that the amount of human capital accumulated in period t, hc_t^i, is an increasing function of labor supply, $f\left(h_t^i\right)$, and that the corresponding stock depreciates at a rate δ^i. For married households, there is an important difference between these two types of investment. The amount saved b_t is owned by the couple and in case of divorce a fraction x is allocated to the husband and the rest to the wife, where x is established by the divorce law in effect at the time of separation. In the data, in case of divorce wealth is divided in half in the majority of cases. The stock of human capital, however, belongs to the individual who accumulated it and remains in her or his possession in case of divorce.

In the model, human capital accumulation and children mechanically generate an increase in intra-household specialization. The spouse with the best wage process specializes in market production. As a consequence, she will accumulate relatively more human capital, which makes her return to market production even higher. Children play a similar role. After the birth of a child, the parents must increase the amount of time they devote to household production. The spouse with the worst wage process will be the one that will absorb most of the increase hence expanding intra-household specialization.

In the no-commitment model we have described, the marital surplus varies over time. To understand why, observe that households characterized by a lower marital surplus are more likely to divorce. Also, the spouse with the worst wage process has a larger return to human capital if the probability of divorce is high, since in case of divorce her earnings will be the only source of income. As a consequence, households with lower surplus are characterized by a lower degree of specialization. Using a similar argument, one can show that households with larger surplus display a higher degree of specialization. This in turn implies that changes in marital surplus will produce variations in the degree of intra-household specialization. This feature of the model enables us to generate the changes in intra-household specialization that in the data is not explained by human capital and children.

In the model we use three variables to generate changes in the marital surplus: children, time spent in household production, and match quality θ. We will now describe how these three variables affect the marital surplus. In married households, an increase in the number of children increases the amount of public goods produced. As a consequence, children expand the gains from marriage.

property law. Common property law establishes that marital property is divided at divorce according to whom has the legal title to the property. Only the state of Mississippi has common property law. In the remaining 49 states, all earnings during marriage and all property acquired with those earnings are community property and at divorce are divided equally between the spouses in community property states and equitably in equitable property states, unless the spouses legally agree that certain earnings and assets are separate property. The assumption that household members can only save jointly should therefore be a good approximation of household behavior.

Similarly, when additional hours are devoted to household production, the amount of public goods produced increases and with it the marital surplus.

We will now describe the effect of match quality on the dynamics of the marital surplus. In our model, match quality, which represents the main source of unobservable heterogeneity, affects at the same time the welfare of both spouses. It has therefore the same effect of a public good. Hence, a change in match quality modifies the marital surplus and hence the optimal degree of intra-household specialization.

To generate changes in match quality and therefore in the degree of intra-household specialization that in the data are not explained by children and human capital, we use the common intuition that a married couple learns gradually over time its true match quality. Specifically, we attempt to capture the general idea that each married household is characterized by an underlying match quality, which represents the fundamental unobserved value of the marriage. The two spouses, however, do not observe the true value of match quality. They only observe a noisy signal. With time this signal becomes more precise and the true value of match quality is gradually revealed. If this is case, there will be two main groups of households: households with an underlying true match quality that is higher than the initial signal and households with an underlying match quality that is below the initial signal. Over time, the first group will generally experience an increase in gains from marriage when they learn that their match quality is higher than initially thought. As a consequence, their degree of specialization will generally increase. The second group of households will generally be characterized by declining gains from marriage and intra-household specialization. The final piece of intuition we want to capture is that it is unlikely that the underlying match quality is constant throughout a marriage. Households experience shocks that change the quality of their marriage.

In the model, we capture these insights in the following reduced-form way. Each couple starts its marriage with an initial value of match quality θ_i and an initial trend for match quality, t_θ, which can be upward or downward. If the match quality trend is upward, in each year of marriage, match quality increases by a given amount. If the trend is downward, every year match quality declines by the same amount. To capture the possibility that the true underlying match quality varies during a marriage, with some probability the household is hit by a shock that changes the match quality trend to a trend that goes in the opposite direction. With this match quality framework, we will be able to generate households with gains from marriage and intra-household specialization that increase over time and households that are characterized by gains and specialization that decline over time.

Individuals have preferences over private consumption c_i, leisure l_i, and the home-produced good Q. The preferences of married individuals depend also on the current value of match quality.

The corresponding utility function, which is $u^i(c_i, l_i, Q)$ for singles and $u^i(c_i, l_i, Q, \theta)$ for married individuals, is allowed to differ between women and men.

We will now formally describe the model using a recursive formulation, starting from the last period T for an arbitrary state of nature ω. The last period is easier to describe because households do not choose savings and there is no human capital accumulation. Consider individual i and suppose that she or he enters the period as married. We determine her or his value function as follows. We first compute individual i's welfare if she or he chooses to divorce. We then compute individual i's welfare conditional on staying married. The individual value function can then be determined by comparing the value of being divorced with the value of staying married.

To compute the value of divorce, observe that the set of state variables S_T for a divorced individual is composed of the individual wage, stock of human capital, savings, and the number of children. Conditional on the value of the state variables and the choice of divorce, individual i chooses consumption, labor supply, time spent in household production, and leisure by solving the following problem:[3]

$$\begin{gathered} V_T^{0,i}(S_T) = \max_{c_T^i, l_T^i, h_T^i, d_T^i} u^i\left(c_T^i, l_T^i, Q_T^i\right) \\ s.t.\ c_T^i + P_T n_T^i + D = w_T^i h_T^i + R_T b_T^i x, \\ Q_T^i = f\left(n_T^i, d_T^i\right), \quad l_T^i + h_T^i + d_T^i = \mathcal{T}^i, \end{gathered}$$

where x is the fraction of household savings allocated to the husband in case of divorce and $V_T^{0,i}$ describes the value of being single for individual i.

To determine individual i's value of staying married it is important to remember that we characterize the decisions of married individuals using a no-commitment model, which corresponds to a standard Pareto problem with the addition of participation constraints. The set of relevant state variables for the solution of this problem includes the wage and stock of human capital of individual i, the wage and stock of human capital of the spouse, savings, the number of children, the value of match quality, and the relative intra-household decision power which the couple entered the period M_T.

The optimal decisions in a no-commitment model can be determined in two steps. In the first step, optimal consumption, labor supply, time spent in household production, and leisure are computed without taking into account the participation constraints and using the relative decision

[3] The dependence on the state of nature will be suppressed to simplify the notation.

power with which the spouses enter period T, i.e. the two spouses solve the following problem:

$$\max_{c_T^i, l_T^i, h_T^i, d_T^i} u^1\left(c_T^1, l_T^1, Q_T, \theta_T\right) + M_T u^2\left(c_T^2, l_T^2, Q_T, \theta_T\right) \tag{1}$$

$$s.t.\ c_T^1 + c_T^2 + P_T n_T = w_T^1 h_T^1 + w_T^2 h_T^2 + R_T b_T, \tag{2}$$
$$Q_T = f\left(n_T, d_T^1, d_T^2\right), \quad l_T^i + h_T^i + d_T^i = \mathcal{T}^i.$$

Let c_T^{i*}, l_T^{i*}, h_T^{i*}, and d_T^{i*} for $i = 1, 2$ be the solution of the couple's problem. Individual i's value of being married at the current relative decision power M_T can then be computed as follows:

$$V_T^{1,i}\left(S_T\right) = u^i\left(c_T^{i*}, l_T^{i*}, Q_T^*, \theta_T\right).$$

In the second step, we verify whether the individual participation constraints are satisfied at the current allocation of resources by comparing the value of staying married with the value of divorce, i.e.

$$V_T^{1,i}\left(S_T\right) \geq V_T^{0,i}\left(S_T\right) \quad \text{for } i = 1, 2.$$

Three possible cases may arise. First, the participation constraints are satisfied for both spouses as both individuals are better off staying married. In this case, the value function of individual i is $V_T^{1,i}(S_T)$. Second, the participation constraints are binding for both agents. In this case the marriage generates a negative surplus and it is optimal to divorce. In this case individual i's value function is $V_T^{0,i}(S_T)$.[4] Third, the participation constraint of only one spouse binds. Without loss of generality suppose that spouse 1's participation constraint binds. Ligon, Thomas, and Worrall (2002) show that in this case the optimal allocation of resources is such that spouse 1 is indifferent between being single or married. Intuitively, this allocation is the one that minimizes the changes from the allocation of resources at the current decision power and hence the one that minimizes the efficiency loss. This allocation can be determined by choosing the level of consumption, labor supply, time devote to household production, leisure, and new relative decision power $M_T^{'}$ that solve the following problem:

$$\max_{c_T^i, l_T^i, h_T^i, d_T^i, M_T^{'}} u^1\left(c_T^1, l_T^1, Q_T, \theta_T\right) + M_T^{'} u^2\left(c_T^2, l_T^2, Q_T, \theta_T\right)$$
$$s.t.\ c_T^1 + c_T^2 + P_T n_T = w_T^1 h_T^1 + w_T^2 h_T^2 + R_T b_T$$
$$Q_T = f\left(n_T, d_T^1, d_T^2\right), \quad l_T^i + h_T^i + d_T^i = \mathcal{T}^i,$$
$$V_T^{1,1}\left(S_T, M_T^{'}\right) = V_T^{0,1}\left(S_T\right).$$

[4]In this model both participation constraints may bind at the same time because of match quality and the possibility of meeting a new spouse if single.

Let c_T^{1**}, l_T^{1**}, c_T^{2**}, l_T^{2**} and $M^{'**}$ be the solution of this problem. Then if the participation constraint of spouse 2 is also satisfied the two spouse stay married and the value function of individual i is

$$V_T^{1,i}\left(S_T\right) = u^i\left(c_T^{i**}, l_T^{i**}, Q_T^{**}, \theta_T\right).$$

Otherwise they divorce and the value function of individual i corresponds to the value of being single $V_T^{0,i}\left(S_T\right)$.

Consider now the case in which individual i enters period T as single. The value function can be computed using the approach described above with two modifications. First, the relative decision power is not a state variable but a parameter that is assumed to be identical across couples and will be estimated. Second, there is no renegotiation. As a consequence, the value function of individual i corresponds to the value of marriage $V_T^{1,i}\left(c_T^{i*}, l_T^{i*}, Q_T^{*}, \theta_T\right)$ if it is greater than the value of staying single and to the value of staying single $V_T^{0,i}\left(S_T\right)$ otherwise.

The household problem has a similar structure in a generic period $t < T$. The only difference is that one have to consider the savings decision, the evolution of human capital, and the trend in match quality.

4 Assumptions on Preferences, Human Capital, Uncertainty, and Household Production

The estimation of the proposed model requires assumptions about preferences and human capital accumulation, about the household production functions, and about the uncertainty that characterizes the environment. The next four subsections outline these assumptions.

4.1 Preferences, Household Production, and Human Capital

We will first describe the preferences of an individual who is single. Her preferences depend on consumption, leisure, and the two household goods. We assume that the corresponding utility function takes a Cobb-Douglas form for consumption and leisure and it is strongly separable in the two public goods, i.e.

$$u^i\left(c, l, Q\right) = \frac{\left(c^{\sigma_i} l^{1-\sigma_i}\right)^{1-\gamma_i}}{1-\gamma_i} + \alpha_i \ln Q.$$

The parameters $\gamma_i > 0$, $\sigma_i > 0$, and $\alpha_i > 0$ are allowed to differ across gender.

We will now describe the economic meaning of the parameters. The parameter γ_i captures the intertemporal aspects of individual preferences. In particular, $-1/\gamma_i$ is individual i's intertemporal elasticity of substitution, which measures the willingness to substitute the composite good $\bar{C} =$

$\left(c^i\right)^{\sigma_i}\left(T-h^i\right)^{1-\sigma_i}$ between different periods. The parameter σ_i captures the intraperiod features of individual preferences and it measures how individual i allocates her or his resources between private consumption and leisure. The parameter α_i captures the significance of the household produced good for individual welfare.

The utility function of a married individual is equal to the utility function of an individual who is single plus the current value of match quality, i.e.

$$u^i\left(c,l,Q,\theta\right)=\frac{c^{1-\gamma_i}}{1-\gamma_i}+\frac{l^{1-\sigma_i}}{1-\sigma_i}+\alpha_{1,i}\ln Q+\theta.$$

The value of match quality θ is not observed. As a consequence every increasing transformation of match quality $f\left(\theta\right)$ would produced identical results.

We will now describe the household production function. Its functional form has been chosen to capture three common insights. First, generally the individual welfare increases with the number of children.[5] Second, conditional on the number of children, the amount of home-produced good should be an increasing function of the time devoted to household production. Third, the amount of Q that can be produced with a given amount of hours should change if children are present. For married households we capture these insights using a production function with the following functional form:

$$Q=f\left(n,d_m,d_w\right)=\left(n+1\right)^{\delta_1}\left(d_w\right)^{\delta_2+n\delta_3}\left(d_m\right)^{\delta_4+n\delta_5},$$

which implies that

$$\ln Q=\delta_1\ln\left(n+1\right)+\delta_2\ln\left(d_w\right)+\delta_3 n\ln\left(d_w\right)+\delta_4\ln\left(d_m\right)+\delta_5 n\ln\left(d_m\right).$$

The parameters have a straightforward interpretation. The parameter δ_1 measures the percentage change in Q if a new child is born independently of its quality. δ_2 captures the effect of the time that the woman devotes to household production on Q. δ_3 measures the additional effect of the woman's hours if the family has children, where the effect is allowed to be positive or negative. δ_4 and δ_5 have a similar interpretation for the men's time. Individuals that are not married have the same functional form for f except that only the domestic labor of the unmarried individual affects the production of Q.

We can now substitute $\ln Q$ in the utility function to understand which preference and production function parameters can be identified. The contribution of the goods Q to the individual welfare can be written in the following way:

$$\alpha_i\ln Q=\alpha_i\delta_1\ln\left(n+1\right)+\alpha_i\delta_2\ln\left(d_w\right)+\alpha_i\delta_3 n\ln\left(d_w\right)+\alpha_i\delta_4\ln\left(d_m\right)+\alpha_i\delta_5 n\ln\left(d_m\right)\quad i=w,m.$$

[5] In the empirical part we will consider only households that have two or fewer children. We will therefore avoid the problem of negative returns to children that may characterized big families.

We therefore have the standard result that only the following combinations of preference and production function paramameters can be identified:

$$\zeta_{1,i} = \alpha_i \delta_1, \quad \zeta_{2,i} = \alpha_i \delta_2, \quad \zeta_{3,i} = \alpha_i \delta_3, \quad \zeta_{4,i} = \alpha_i \delta_4, \quad \zeta_{5,i} = \alpha_i \delta_5 \quad i = w, m.$$

An important component of the model is the accumulation of human capital. In this paper, it take the form of labor market experience. If an individual works full time during a period, his experience increases by one year. Instead, if he works part time, his labor market experience increases by half a year. The stock of human capital depreciates if an individual does not supply market labor during a period. The accumulated stock of human capital and its depreciation affect the probability distribution of wages. Individuals with more experience have a wage distribution with a higher mean. Similarly, individuals who supplied labor during the previous period have wage offers that are on average higher.

4.2 Sources of Uncertainty

In the model, individuals face four sources of uncertainty: wage shocks, fertility shocks, match quality shocks, and marriage market shocks. In this subsection we describe how we model them.

In the model the wage process should generate part of the intra-household specialization observed in the data. To that end, we use a wage precess with the following two features. First, women and men are allowed to have different wage processes. Second, human capital accumulation has an effect on the wage process of men and women. We incorporate these two features in the model as follows. We first assume that w_t^i is log-normally distributed with a mean and variance that differ across gender. Second, we assume that the mean is a linear function of labor market experience and of a dummy equal to one if the individual worked in the previous period. The wage process can therefore be written in the following way:

$$\ln w_t^i = \xi_{1,i} + \xi_{2,i} exp_{t,i} + \xi_{3,i} exp_{t,i}^2 + \xi_{4,i} lfp_{t-1,i} + \epsilon_{t,i},$$

where $\epsilon_t \sim N\left(0, \sigma_\epsilon^i\right)$ and ϵ_t is assumed to be identically and independently distributed over time. The coefficient $\xi_{1,i}$ measures the expected wage for an individual with no experience. The parameters $\xi_{2,i}$ and $\xi_{3,i}$ measure the linear and concave effect on wages of an additional year of experience. The parameter $\xi_{4,i}$ describes the effect of human capital depreciation on the expected wage. An individual that did not participate in the labor market in the previous period has an expected wage that is $\xi_{4,i}$ percent lower than the wage of an individual that supplied labor. Here we make the simplifying assumption that the depreciation is independent of the accumulated stock of human capital.

The fertility process is a second source of intra-household specialization. For computational reasons, we do not allow individuals to choose the timing and number of children. Instead, we follow Brien, Lillard, and Stern (2006) and assume that the fertility choices can be characterized using a statistical process that matches the data. The generalization of the current model to an environment in which individuals are allowed to choose when to have children is important, but it is left for future research.

The statistical process for fertility is estimated using a standard probit. The sample employed to estimate the probit includes married and unmarried women. An observation is a woman/year and the dependent variable is a dummy variable that takes the value of one if the number of children in the household increases in the year following the current year. We experimented with two sets of independent variables. The first set includes marital status, number of existing children, savings, labor supply, and age and wage of the woman. This specification would enable the woman to have control over the fertility process. However, it would have the unrealistic property that women that do not wish to have a child would increase their labor supply and savings with the purpose of decreasing the fertility rate. For this reason, we decided to restrict the set of independent variables to marital status, existing children, and the woman's age. Specifically, we estimate a specification that includes the following variables: a dummy equal to one if the woman is younger than 25, and similar dummies if the woman is between the ages of 25 and 29, between the ages of 30 and 34, or between the ages of 35 and 39; the same dummies interacted with marital status; and a dummy equal to 1 if the household already has a child. For computational reasons, we limit the number of children in a household to be smaller than or equal to 2. Table 3 reports the estimates for the fertility probit. The most important predictor of fertility are marital status and age. Everything else equal, a married woman between the ages of 25 and 29 has a probit score that is higher by .695 standard deviations. Evaluated at the mean, this implies that a married woman has a 6.8 percentage point higher probability of having a child during a given year. This effect is large relative to the overall fertility rate in the sample of 10.1%. The current number of children in the household is also predictive. Relative to households without children, households with one child are more likely to give birth to a second child.

Match quality represents a third source for intra-household specialization. As discussed in the previous section, we model in a reduced form way a framework of learning about match quality. Specifically, we assume that match quality in period t is perceived to be

$$\theta_t = \theta_{t-1} + t_\theta \Delta\theta,$$

where t_θ is a positive slope if the household is characterized by a positive trend and negative otherwise, $t_\theta \Delta\theta$ is the constant increase or decrease in match quality that affect the household in each period of marriage, and $\theta_{t-1} = \theta_i$, the initial value of match quality, if $t-1$ is the year of marriage. The slope t_θ will be estimated, whereas $\Delta\theta$ will be set equal to the average value of match quality from which households can initially draw θ_i, conditional on the initial match quality being positive. With a given probability p_θ, in each period households switch from the current trend to a trend with opposite sign.

The marriage market is modeled using a simply random search framework. In each period, an individual who is single meets with probability one a potential spouse. The set of characteristics that defines the potential spouse are drawn from a uniform distribution which is constructed using a discretized version of the continuous state variables which will be discussed in the next section. There is one exception to the assumption that the potential spouse is drawn from a uniform distribution. We assume that an individual draws a potential spouse with similar wealth to capture the common insight that individuals generally meet partners of similar economic and social extraction. In practice, we compute the point on the wealth grid that is the closest to the wealth level of the unmarried individual. We then assume that she can only meet a potential spouse with a wealth level that is one point below, one point above, or at the same point of the wealth grid.

5 Estimation Implementation

This section discusses the estimation of the model developed in this paper. The model is estimated using the Simulated Method of Moments (SMM) and data from the 1984-1996 waves of the PSID. In 1997 the survey was redesigned for biennial data collection. For this reason, data gathered starting in 1997 are not included.[6]

To estimate the parameters using the SMM, the model is first simulated to generate an artificial data set of labor supply, marital status, consumption, and wealth paths. The simulated data are then used to compute moments such as the divorce hazard rate, the percentage of married individuals, the average labor supply of married men. These simulated moments are then compared with the corresponding moments computed using the actual data. The objective of the estimation is to search for structural parameters that minimize a weighted sum of the distances between the simulated and data moments. In the estimation we use the inverse of the covariance matrix of the data moments as a weighting matrix. The covariance matrix is computed using a standard bootstrap method with 10000 bootstraps.

We will now describe the main aspects of the simulation that is required to compute the simulated moments. In case of divorce, in the model household wealth must be divided between the

[6]In 1990, 2,000 latino households were added to the sample. This latino sample was dropped after 1995 and replaced with a sample of 441 immigrant families in 1997. We exclude both the latino and immigrant samples.

spouses. To determine the fraction that is allocated to the wife, we use divorce settlements from the National Longitudinal Study of the High School Class of 1972 (NLS-72), Fifth Follow-up (1986). The sample (n=1685) includes all first marriages that ended in legal divorce prior to 1986. The average percentage of wealth allocated to the wife is 0.496 with a standard deviation of 0.177, where household wealth is the total net value of all property including the house value and the value of other real estate. In the simulation we, therefore, assume that wealth is divided equally between the two spouses.

To deal with households that have income levels below the subsistence level, we introduce subsidies in the form of the Earned Income Tax Credit (EITC). This program was introduced 1975 and was made more generous over the years. The EITC is a refundable federal income tax credit for working individuals and families with income below given thresholds. Conditional on the number of children, there are three income thresholds that determine the amount of the credit. The first threshold τ_1 determines the end of the phase-in part of the EITC: families with income below τ_1 receive a credit that is equal to a percentage g_1 multiplied by the family income. The second threshold τ_2 establishes the end of the plateau part of the EITC: families with income between τ_1 and τ_2 receive a constant credit which is equal to the percentage g_1 multiplied by the first threshold τ_1. The last threshold τ_3 ends the phase-out part of the EITC where families with income between τ_2 and τ_3 receive a credit that declines at a rate g_2 starting from $g_1\tau_1$. For instance, for a household with two children, in 1993, τ_1, τ_2, and τ_3 were equal to $\$7,750$, $\$12,200$, and $\$23,050$, respectively. The percentages g_1 and g_2 were set equal to 19.5% and 13.93%.

In the simulation one has to decide which parent receives custody of the children in case of divorce. According to the United States Census, 58.1% of mothers are the custodial parent. Data collected from the US Census also indicates that only 54.9% of fathers have either joint custody or visitation rights. The standard arrangement in case of visitation rights is that the non-custodial parents can spend 2 weekend days every two weeks with their children. This corresponds to around 15% of time for 54.9% of fathers. To be consistent with these facts, it is assumed that mothers maintain custody of their children and that children spend 85% of their time with the mother and the remaining 15% with the father. In the simulation, we implement this by multiplying the number of children in the production function of a divorced mother by 0.85 and of a divorced father by 0.15. In addition, the mother pays 85% of the children's cost and the father the residual part. To simplify the simulation, it is also assumed that in case of remarriage of one of the two parents, the children spend 100% of their time with the mother and that the father does not pay any child cost. This is equivalent to assuming that the utility provided by children to divorced fathers in case of remarriage is equivalent to the utility provided by the quantity of composite good $\bar{C}$ that divorced fathers can purchase with the income they save by not paying the cost of children.

The state space has been chosen to reflect the features of the sample that will be used in the simulation. We start with a description of the grid for the three sources of uncertainty. First, the continuous distribution of real wages is approximated using the method proposed by Kennan (2004). He shows that the best discrete approximation $\hat{F}$ to a given distribution F using the fixed support points $\{w_i\}_{i=1}^{n}$ is given by

$$\hat{F}(w_i) = \frac{F(w_i) + F(w_{i+1})}{2},$$

where n denotes the number of support points and i indexes each point. In the simulation we set n equal to 3 and we use as grid points the real wages that corresponds to the 1/6th, 3/6th, and 5/6th point of the empirical distribution. The corresponding grid for women is \$2.93, \$4.70, and \$7.91. The grid for men is \$3.96, \$6.60, and \$10.72. Dollar values are reported in 1984 dollars. Second, the grid for children is composed of 3 points, starting with zero children and ending with 2 children. The number of children varies according to the fertility process illustrated in the previous section. Third, it is assumed that the initial match quality is drawn from a five-point distribution.

The decision variables savings and relative decision power, M, are also discretized. Wealth is described using an equally-spaced 12-point grid varying between -\$75,000 and \$200,000 for singles and between -\$150,000 and \$400,000 for married individuals. This range is chosen to reflect the distribution of total wealth minus home equity and the value of vehicles in the PSID, where about 5.2% of households report a wealth level below our range and 4.7% above. We have experimented with using a larger range for wealth, particularly on the high end, and we have found that few households choose to accumulate such high levels of wealth. The grid for relative decision power includes 13 points: 0.000001, 0.05, 0.10, 0.20, ..., 0.80, 0.90, 0.95, and 0.99999. We have tested the robustness of the simulations with respect to changing the number of grid points for the relative decision power and we have found that it is important to include a reasonably fine grid. With a grid that is too coarse, there may be mutually beneficial marriages that do not occur because the grid does not contain any point within the range of Pareto weights for which the marriage is sustainable.

The grid for experience requires a separate discussion. This grid can be constructed in two different ways. A first possibility is to choose a number of points for the grid that is equal to the number of periods in the simulation. Then in a given year, the individual's experience increases by one if she works full time and by half if she works part time. This approach is computationally demanding since it increases significantly the size of the state space. We therefore adopt a different strategy that generates similar results. The grid for experience is constructed using a two-point distribution, 0 and 20 years. Experience then increases according to the following law of motion. If an individual with 0 experience works full time in a given period, she has a 1 in 20 chances of moving to the high experience state. If she works part time, the probability of moving to the higher experience level decreases to 1 in 40 changes. Thus, the expected increase in experience for such an individual is equivalent to the expected increase generated by the first approach. This mechanism allows us to capture the effect of labor supply on human capital accumulation without using a grid that makes the simulations excessively time consuming.

The model is simulated for 60 periods. In the first 40 periods individuals make decisions about marriage, labor supply, consumption, and savings. The remaining 20 years represent the retirement period, where individuals can only choose consumption and saving. The rate of return on savings is allowed to change over time. In particular, for 1982-2004 the 20-year municipal bond rate is used as the relevant rate of return.[7] For 2005-2009 the interest rate is assumed to remain unchanged at the 2004 level.

We solve the problem using backward induction. Consider an arbitrary period. Each individual enters the period either as single or married. If the individual is single, she draws a potential spouse from the distribution of available spouses. For this unmarried individual and her potential spouse, we first evaluate the level of utility associated with being single. We then compute the level of utility associated with being married this period and with making optimal decisions from next period onward. The level of utility conditional on marital status is computed by checking all possible alternatives for consumption, labor supply, time devoted to household production, and savings, and by selecting the choice that yields the highest level of utility. The two individuals will choose to marry and the corresponding value of consumption, labor supply, time devoted to household production, and savings if for both of them the value of being married is higher than the value of being single.

If two individuals enter the period as married, we follow a similar procedure with the following exception. The value of being married must first be computed at the value of the relative decision power with which the two spouses entered the period. We then determine to which of the following three regimes the couple belongs: (i) both individuals prefer being single; (ii) both individuals prefer being married; (iii) one individual prefers being single whereas the other is better off as married. In the first two cases the marital choice is straightforward: in case (i) they stay married at the current decision power, while in case (ii) they divorce. In the third case, we allow the couple to renegotiate the current and future allocation of resources. Specifically, we find the allocation that makes the constrained spouse just indifferent between being single and being married to the current partner. This goal is achieved by shifting the relative decision power, and accordingly the allocation, until this indifference condition is satisfied. If at the new allocation both individuals prefer being married, the couple remains married. Otherwise the two spouses divorce since the

[7]The rates are obtained from Bloomberg.

marriage generates no positive surplus.

It is worth discussing in more details the mechanism by which potential spouses are drawn. Each individuals is characterized by his own experience, wage, wealth, number of children, relative decision power, and match quality. For potential spouses, experience and wages are drawn from the discrete grid described above. Wealth is drawn using a similar approach, but as mentioned earlier each individual can only draw a potential spouse with a wealth level that is one point below, one point above, or at the same point in the wealth grid. With regard to children, it is assumed that single men draw only women with no children. We make this assumption for two reasons. First, men in the age range considered in our simulations marry mostly women with no children. Second, in our model men derive utility from children independently of whether the children were conceived during or before the marriage. This implies that, if we do not make this assumption, single men search for single women with children to increase their utility after marriage, which is unrealistic. The initial relative decision power, M, is estimated with the rest of the parameters. Finally, match quality is drawn from our discrete grid with equal probability for each point.

The solution of the model generates value functions for single and married individuals. The value functions are then used to simulate the model for the group of individuals available in the 1984 wave of the PSID that satisfy the selection restrictions mentioned above. For each individual in the 1984 wave we match her experience and number of children to the point of the corresponding grid that most closely approximates each of the characteristics observed in the data. For married individuals there are two state variables that are not observed: relative decision power and match quality. We need to make two assumptions for individuals who are already married in the 1984 wave. First, we assume that their relative decision power is equivalent to the one that characterizes a newly married couple. After the first period, their relative decision power is optimally computed. Second, we assume that their initial match quality is drawn from our grid using a probability distribution that assigns higher probabilities to positive values of match quality, where the probability is estimated. Each individual is then simulated 100 times for the period 1984-2034.

We now describe how individuals are followed in the simulation. In the simulation there are three groups of individuals. The first group includes individuals that are in the 1984 wave and in 1968 lived in one of the households that formed the original 1968 PSID sample. These individuals are tracked by the PSID even if there is a split-off. There are two main reasons for a split-off: a child in one of the original families forms her own household; or a couple in the original sample or one of their children divorces. We will refer to them as tracked individuals. Given the age range used in this paper, all our tracked individuals are children of families in the original sample. The second group comprises of individuals that are in the 1984 wave, but are not tracked by the PSID. If there is a split-off, they vanish from the data set. The third group is composed of individuals that appear in the simulation as potential or actual spouses of the tracked agents. To illustrate the different treatment in the simulation of these groups, consider the case of a track individual who is single in the initial period. In this period, she meets a potential spouse. If the couple decides not to marry, the potential spouse is dropped from the simulation. If the couple marries, the drawn individual will remain in the simulated sample until the couple chooses to divorce. For individuals who are initially married, only one of the two individuals is the tracked agent. The other individual is dropped from the simulation if the household ever decides to divorce.

27 parameters are structurally estimated: the wage parameters (10); the preference parameters (4); the parameters that determine the effect of children and of the time devoted to household production on the individual utility (10); the match quality parameters (4); the cost of divoce; the initial pareto weight; and the probability of meeting a potential spouse if the woman has children. The risk aversion parameters are set equal to 1 for both men and women. The discount factor is also assumed to be identical for women and men and equal to 0.99. The remaining parameters are identified using the following moments. We use 13 wage and labor supply moments: the labor force participation of single women, single men, married women, and married men; the fraction of women and of men working at $t-1$, but not working at t; the standard deviation of women's and men's wage residuals; the difference between the average wage of women who have between 6 and 19 years of experience and women who have 5 years of experience or less; the difference between the average wage of women who have 20 years of experience or more and women who have between 6 and 19 years of experience; the same two moments for men. We employ 5 leisure moments: the average leisure of single women and men; the ratio between the wife's and husband's leisure the first year of marriage for couples with no children; the same moment for couples with children. We use 8 household production moments: the average hours devoted to household production by single women with and without children, single men with and without children, married women with and without children, married men with and without children. Finally, we use 7 marriage and divorce moments: average years of marriage; marriage hazard with and without children; divorce hazard with and without children; divorce hazard after one year of marriage; divorce hazard after 3 years of marriage.

6 Results

This section first presents the estimation results and then uses simulated data obtained employing the estimated coefficients to evaluate the ability of the model to replicate the patterns observed in the actual data. For consistency with the PSID survey, tables and figures constructed with the simulated data only use tracked or married individuals.

Tables 5, 6, and 7 report the coefficient estimates. Tables 8, 9, and 10 presents the data moments and the simulated moments used in the estimation. The model does a good job in matching most of the moments. The main exceptions are the marriage hazard for households with children, which in our model is predicted to be too low, and the divorce hazard after 3 years of marriage, which is lower than in the data.

Table 11 describes some static simulated and data moments for labor supply and household production. The model can generate the general pattern observed in the data for the amount of labor hours supplied to the market. Married men work more hours than single men, who work longer hours than single women, who supply more hours than married women. However, the model underestimate labor hours for all individuals. The model does a very good job in explaining the labor force participation and household production decisions for all men and women. But this outcome is not surprising since we used these moments in the estimation. The labor supply and household production patterns generated by our simulations are explained by four aspects of the model: differences in the wage process between women and men; differences in time spent in household production between women and men and between married and single individuals; the presence of children in the household; human capital accumulation. Women work less than men because they have on average lower wage offers. This feature of the wage process also explains why married men work more than single men and single women supply more market hours than married women. Since the two spouses cooperate, it is optimal for the husband to specialize in market production and for the wife in domestic production. Children further increase the degree of specialization within the household for two reasons. First, both parents devote more time to household production, but mothers experience a larger increase. Everything else equal, this implies that it is costlier for wives to supply labor to the market. Second, since in our model mothers receive custody of their children in case of divorce, the presence of children transfers bargaining power from the husband to the wife. This leads married men to increase and married women to decrease labor supply. Human capital accumulation has a similar effect as children on labor supply. Intra-household specialization reduces the wife's labor supply and increases the husband's. Thus, married women accumulate less human capital relative to married men. Therefore the couple's efficient allocation of resources requires an additional increase in the husband's labor supply and an additional reduction in the wife's labor supply.

The model is not as good at explaining the variation by marital status in wealth observed in the data. The model can match the empirical finding that unmarried men save more than unmarried women. But the difference is not as large as in the data. A more significant failure of the model is its inability to generate the large difference in wealth holding observed in the data between married couples and unmarried individuals. In the model, couples save more than twice the amount saved by unmarried individuals. But the difference in wealth by marital status is far from the difference observed in the PSID.

We will now evaluate the ability of the model to explain the evolution of labor supply and time devoted to household production during a transition into and out of marriage. Figure 19 describes the labor supply pattern for women as they enter marriage. As before, an index is used where 0 denotes the first year of a transition between marital states. In the PSID, women's labor supply decreases starting one-two years prior to marriage and continues to gradually decrease during the first five years of marriage. Moreover, at the time of marriage women's labor supply is between the average labor supply of married women and the average labor supply of single women. The model can generate the pattern observed in the data starting from the year in which the woman marries. In the simulations, in the year of marriage women supply on average an amount of labor that is between the labor hours supplied by single women and married women. After women enter marriage, in the model their labor supply declines steadily until the fifth year of marriage when their labor hours reach the level of the average married woman. The model cannot replicate the decline in labor hours in the one-two years that precede marriage. This outcome should be expected since in our model individuals meet and immediately choose whether to marry. There is therefore no dating period in which the two potential spouses may decide to start preparing for marriage by changing their labor supply decisions. The gradual decline of labor supply for married women after marriage is explained by three features of our model: the presence of children; the differential accumulation of human capital between wife and husband; the absence of commitment. During these years married women tend to work less and less as they increase the time devoted to household production and increase their bargaining power in the marriage. This causes married women to accumulate less human capital relative to married men. For the household, it is therefore optimal to further increase specialization by reducing the wife's labor supply and by increasing the husband's hours of work even more. The lack of commitment produces a more gradual decline in the amount of hours supplied by wives. To see this note that married women know that with some probability the marriage will end, in which case the accumulated human capital will be important. Conditional on children, the probability of divorce depends on the level of match quality. In our model the marriages that survive are the ones with an upward trend in match quality or, equivalently, marriages where the spouses learn over time that the quality of their match is high. In this marriages, the spouses increase gradually the degree of specialization, which explain the gradual decline in labor supply of women. Figures 21 and 23 show the simulation results for labor force participation and labor supply conditional on working. Figure 25 presents the simulation results for household production before and during marriage. The model is able to replicate the patterns observed in the data at the time of marriage and after.

Figure 20 describes the labor supply behavior of men generated by the model as they enter marriage. Similarly to the pattern observed in the PSID, in the model men increase their labor hours at the time of marriage. However, the model cannot generate the gradual increase in labor supply after men enter marriage. Married men move to the higher level of labor supply and remain there during the years they stay married.

Figure 27 describes women's labor supply before and after divorce. Both this figure and the analogous figure obtained using the PSID describe a steady increase in labor supply beginning several years prior to divorce. In the model this behavior is explained by two types of married couples: couples with a downward trend in match quality and couples in which the wife experiences a high wage offer and therefore increases her labor supply. To provide the intuition underlying this result, consider first a couple with a downward trend in match quality. In this case, the probability of divorce increases over time. It is therefore optimal for the spouses to reduce the degree of intra-household specialization, which explains the gradual increase in the wife's labor supply. Consider now a couple in which the wife receives a good wage offer. In this case, she will increase her labor supply and reduce the time spend in household production. As a consequence, the marriage produces a lower amount of public good, which increases the probability of divorce. As a consequence, it is optimal for the pair to reduce the degree of specialization, which increases even more the probability of divorce. Figures 29 and 30 show the simulation results for labor supply conditional on working and labor force participation.

Figure 28 describes the labor supply pattern for men before and after divorce. This Figure should be compared to Figure 16 which describes the same pattern in the PSID. In the PSID, before divorce men work about the same amount of hours as the average married man. In the simulation labor supply displays a similar pattern. In the PSID, after divorce men decrease gradually their labor supply. In the model, similarly to what is observed in the data, men experience a drop in labor supply the year of the divorce. But then increase their labor hours, which is not the pattern displayed by the data.

7 Policy Evaluation

In this section we use the estimated model to evaluate the effect of two policies on the labor supply and household production decisions of low-income households. The first one consists in the removal of the EITC program. The second policy replaces the EITC with a program that is meant to reduce the labor supply disincentives that are implicit in the EITC. The alternative program has the following features. A family with an income below $\bar{Y}$ receives, independently of labor supply decisions, a fixed subsidy equal to the percentage paid by the EITC program in its phase-in part,

g_1, times $\bar{Y}$. The threshold $\bar{Y}$ is set equal to the phase-in threshold in the EITC program. This part of the program is designed to account for individuals that have little or no chance of finding a job. We will refer to this group as the unemployable. A family with an income between $\bar{Y}$ and the poverty line receives a subsidy S if at least one adult is employed during the year. The subsidy is computed so that the total cost of the new policy is identical to the total cost of the EITC. We use the poverty lines for 1984 published by the Department of Health and Human Services. We will refer to the alternative program as the Labor Supply Subsidy (LSS).

The policy results are reported in Table 12 for men and Table 13 for women. As expected, the elimination of the EITC program has a positive effect on the labor supply and labor force participation of single men and women. For married couples, the effect is negligible since all married men were already working long hours with the EITC. The effect on individual welfare, however, is negative and the reduction in the fraction of households below the poverty line is negligible at 0.1 percent. The replacement of the EITC program with the alternative subsidy schedule has larger effects. The labor force participation of men increases from 70% to 94%. This change is driven almost exclusively by single men, whose labor force participation goes from 66% to 93%. Similar results characterize women. Their labor force participation increases from 60% to 78%, with most of the change generated by single women. An unintended consequence of the new policy is that, conditional on working, the average labor supply of men and women decline significantly. This change is produced by the men and women who enter the labor market after the policy change. Most of these individuals choose to work part-time to become eligible for the subsidy and at the same time enjoy as much leisure as possible. An alternative to the proposed policy that would address this issue is one that would require individuals to work full-time to qualify for a subsidy. With the LSS program the fraction of families below the poverty line declines by half percentage point. This is a substantial fraction, but lower than we expected.

8 Conclusions

Using the PSID, we present new empirical patterns regarding the labor supply, household production, and savings decisions of married and unmarried women and men. Using the information collected from the data, we develop and estimate a unified model of labor supply, saving, and marital decisions. The estimated model is capable of matching most of the patterns observed in the data. The estimated model is then used to evaluate alternative subsidy programs.

References

Andres, Erosa, Luisa Fuster, and Diego Restuccia. 2005. "A Quantitative Theory of the Gender Gap in Wages." *Manuscript.*

Attanasio, Orazio, and Jose-Victor Rios-Rull. 2000. "Consumption smoothing in island economies: Can public insurance reduce welfare?" *European Economic Review* 44 (7): 1225–1258 (June).

Blundell, Richard, Pierre-Andre Chiappori, Thierry Magnac, and Costas Meghir. 2007. "Collective Labour Supply: Heterogeneity and Non-Participation." *Review of Economic Studies* 74:417–445.

Browning, Martin, Francois Bourguignon, Pierre-Andre Chiappori, and Valerie Lechene. 1994. "Income and outcomes: a structural model of intrahousehold allocation." *Journal of Political Economy* 102:1067–96.

Casanova, Maria. 2010. "Happily Together: A Structural Model of Couples' Joint Retirement Choices." *Working Paper, UCLA.*

Chiappori, Pierre Andre. 1988. "Rational household labor supply." *Econometrica* 56:63–89.

———. 1992. "Collective labor supply and welfare." *Journal of Political Economy* 100:437–467.

Chiappori, Pierre Andre, Bernard Fortin, and Guy Lacroix. 2002. "Marriage Market, Divorce Legislation, and Household Labor Supply." *Journal of Political Economy* 110 (1): pp. 37–72.

Donni, Olivier. 2004. "A Collective Model of Household Behavior with Private and Public Goods: Theory and Some Evidence from U.S. Data." *DELTA Working Papers.*

Fernandez, Raquel, and Joyce Cheng Wong. 2011. "The Disappearing Gender Gap: The Impact of Divorce, Wages, and Preferences on Education Choices and Women's Work." *NBER Working Papers*, no. 17508.

Gemici, Ahu. 2011. "Family Migration and Labor Market Outcomes." *Working Paper, NYU.*

Gemici, Ahu, and Steve Laufer. 2011. "Marriage and Cohabitation." *Working Paper, NYU.*

Guner, Nezih, and John Knowles. 2003. "A Quantitative Theory of the Gender Gap in Wages." *Manuscript.*

Heckman, James J., and Thomas E. Macurdy. 1980. "A Life Cycle Model of Female Labour Supply." *The Review of Economic Studies* 47 (1): pp. 47–74.

Jones, Larry E., Rodolfo E. Manuelli, and Ellen R. McGrattan. 2003. "Why are married women working so much?" no. 317.

Kennan, John. 2004. "A Note on Approximating Distribution Functions." *Manuscript.*

Kocherlakota, Narayana R. 1996. “Implications of Efficient Risk Sharing without Commitment.” *Review of Economic Studies* 63:595–609.

Ligon, Ethan, Jonathan P Thomas, and Tim Worrall. 2002. “Informal Insurance Arrangements with Limited Commitment: Theory and Evidence from Village Economies.” *Review of Economic Studies* 69:209–44.

Lundberg, Shelly, Richard Startz, and Steven Stillman. 2003. “The retirement-consumption puzzle: a marital bargaining approach.” *Journal of Public Economics* 87 (56): 1199 – 1218.

Manser, Marilyn, and Murray Brown. 1980. “Marriage and Household Decision-Making: A Bargaining Analysis.” *International Economic Review* 21 (1): pp. 31–44.

Marcet, Albert, and Ramon Marimon. 1992. “Communication, commitment, and growth.” *Journal of Economic Theory* 58 (2): 219–249 (December).

———. 1998. “Recursive Contracts.” *Working Paper, European University Institute*, no. eco98/37.

Mazzocco, Maurizio. 2004. “Saving, Risk Sharing, and Preferences for Risk.” *The American Economic Review* 94 (4): pp. 1169–1182.

———. 2007. “Household Intertemporal Behaviour: A Collective Characterization and a Test of Commitment.” *Review of Economic Studies* 74:857–895.

McElroy, Marjorie B., and Mary Jean Horney. 1981. “Nash-bargained household decisions: toward a generalization of the theory of demand.” *International Economic Review* 22:333–349.

Olivetti, Claudia. 2006. “Changes in Women’s Hours of Market Work: The Role of Returns to Experience.” *Review of Economic Dynamics* 9 (4): 557–587 (October).

Rios-Rull, Jose-Victor, Jacob Short, and Ferdinando Regalia. 2010. “What Accounts for the Increase in the Number of Single Households?” no. 995.

Tartari, Melissa. 2007. “Divorce and Cognitive Achievement of Children.” *Working Paper, Yale University.*

Thomas, Duncan. 1990. “Intra-household resource allocation: An inferential approach.” *Journal of Human Resources* 25:635–664.

van der Klaauw, Wilbert, and Kenneth I. Wolpin. 2008. “Social security and the retirement and savings behavior of low-income households.” *Journal of Econometrics* 145 (1-2): 21–42 (July).

Voena, Alessandra. 2011. “Yours, Mine and Ours: Do Divorce Laws Affect the Intertemporal Behavior of Married Couples?” *Working Paper, Stanford University.*

B. Tables

Table 1: PSID Descriptive Statistics

	Mean	SD
Marital Status and Transitions:		
percentage married	.79	(.41)
marriage hazard	.101	(.392)
divorce hazard	.030	(.169)
Labor Force Participation:		
single women	.91	(.26)
single men	.96	(.18)
married women	.66	(.39)
married men	.98	(.15)
Annual Hours Worked if Working:		
single women	1861	(669)
single men	2095	(711)
married women	1660	(736)
married men	2312	(622)
Annual Hours Spent on Household Production:		
single women	604	(482)
single men	372	(349)
married women	1287	(729)
married men	366	(351)

Note: The PSID is a longitudinal study of a representative sample of U.S. individuals. The sample is from the 1968-1996 waves and the 1984, 1989 and 1994 Wealth Supplement Files. The Latino and Immigrant Samples have been excluded along with the 1968 low-income Census oversample. The sample is restricted to include only household heads and wives, not sons, daughters or other household members, unless they have started their own household. After these exclusions there are 29,594 total individual-year observations, or, about 2000 individual-year observations per year. Each survey wave records extensive individual-level information on labor supply and wages. Annual hours worked is constructed as the typical number of hours worked at each of up to three jobs multiplied by the number of weeks during the year worked at each job. Wages are calculated as annual individual labor market income divided by total annual hours worked. After-tax wages are adjusted for federal and state income tax using the NBER's TAXSIM using household income, year, state of residence, marital status, and number of children.

Table 2: Average Wealth Levels in the PSID

married couples	\$49,732
unmarried individuals	\$11,161
married couples the year before divorce	\$18,471
individuals the year before marriage	\$11,499
just married couples	\$19,798
just divorced individuals	\$8,385

Note: The transitions are described over the last year. For example, "married couples just before divorce" are currently married but will not be married next year and "just married couples" are currently married but were not married last year. The wealth measure excludes wealth in housing and cars.

Table 3: Estimates of Fertility Process (Probit)

dependent variable	
$25 \leq$ age < 29	-.114
	(.081)
$29 \leq$ age < 34	.105
	(.083)
$35 \leq$ age < 39	.261
	(.088)
age < 25 and married	.675
	(.065)
$25 \leq$ age < 29 and married	.695
	(.063)
$30 \leq$ age < 34 and married	.507
	(.068)
$35 \leq$ age < 39 and married	.067
	(.077)
one child	0.175
	(.032)
constant	-1.486
	(.057)
n	11180

Note: The dependent variable is a dummy equal to one if during the current year the household gives birth to a child.

Table 4: Annual Cost of Children, CEX 1980-1996

dependent variable	
cost for first child	486.0
	(16.2)
cost for second child	370.8
	(17.0)
cost for additional children	287.3
	(9.98)

Note: The dependent variable is a measure of annual expenditure that includes food at home, child care, boy's clothing and shoes, girl's clothing and shoes, and infant clothing. The sample includes households with the head with ages 20 to 40. All dollar values have been deflated to reflect year 1984 dollars. Coefficients for after tax income, age of the household head, education of the household head, race and marital status are omitted. The regression includes 29,961 observations and the R^2 is .36.

Table 5: Estimates for the Wage Processes

Women	
experience	0.622
experience^2	-0.021
dummy if not working at $t-1$	-0.424
constant	1.351
standard deviation	4.861
Men	
experience	0.409
experience^2	-0.011
dummy if not working at $t-1$	-0.548
constant	1.636
standard deviation	5.452

Table 6: Estimates of the Public Good Parameters

Women's Preferences	
children	0.323
woman's household time	0.106
man's household time	0.0001
woman's household time X children	0.100
man's household time X children	0.0000
Men's Preferences	
children	2.011
man's household time	0.929
woman's household time	0.478
man's household time X children	0.0002
woman's household time X children	0.415

Table 7: Estimates of the Remaining Parameters

Woman's leisure parameter	0.698
Man's leisure parameter	0.698
Initial probability of an upward trend	0.45
Trend in match quality	2.301
Probability of changing trend	0.12
Probability a married couple draws an initial negative match quality	0.09
Initial Pareto weight	0.28
Prob a woman meets a potential spouse if kids	0.33
Cost of divorce	28,543

Table 8: Moments Used in Estimation

	Data	Simulation
Wage and Labor Supply Moments:		
LFP of single women	0.910	0.891
LFP of single men	0.960	0.967
LFP of married women	0.662	0.693
LFP of married men	0.983	0.997
Fraction of women working at t-1 not working at t	0.055	0.057
Fraction of men working at t-1 not working at t	0.009	0.011
Standard deviation of women's wage residuals	2.880	3.028
Standard deviation of men's wage residuals	3.483	2.744
$E\left[w_t^w \mid 5 \leq Experience < 20\right] - E\left[w_t^w \mid Experience < 5\right]$	1.876	3.689
$E\left[w_t^w \mid Experience \geq 20\right] - E\left[w_t^w \mid 5 \leq Experience < 20\right]$	0.154	3.528
$E\left[w_t^m \mid 5 \leq Experience < 20\right] - E\left[w_t^m \mid Experience < 5\right]$	2.184	3.583
$E\left[w_t^m \mid Experience \geq 20\right] - E\left[w_t^m \mid 5 \leq Experience < 20\right]$	0.159	1.227

Table 9: Moments Used in Estimation

	Data	Simulation
Leisure Moments:		
Average leisure of single women	2,843	2,577
Average leisure of single men	2,779	2,538
Ratio wife's to husb's leisure 1st year of mar, no kids	1.160	0.996
Ratio wife's to husb's leisure 1st year of mar, with kids	1.144	1.016
Household Production Moments:		
Average hours on hous prod by single women no kids	473	408
Average hours on hous prod by single men no kids	368	357
Average hours on hous prod by married women no kids	788	756
Average hours on hous prod by married men no kids	350	367
Average hours on hous prod by single women with kids	715	729
Average hours on hous prod by single men with kids	449	357
Average hours on hous prod by married women with kids	1357	1061
Average hours on hous prod by married men with kids	368	364

Table 10: Moments Used in Estimation

	Data	Simulation
Marriage Moments:		
Years of marriage	7.475	7.427
Marriage hazard no kids	0.100	0.094
Marriage hazard with kids	0.102	0.054
Divorce Moments:		
Divorce hazard no kids	0.041	0.035
Divorce hazard with kids	0.015	0.016
Divorce hazard after 1 year of marriage	0.072	0.091
Divorce hazard after 3 years of marriage	0.060	0.013

Table 11: Simulation Results

	Data	Simulation
Annual Hours of Work if Working:		
single women	1861.3	2125.3
single men	2095.6	2301.3
married women	1660.2	1761.8
married men	2312.3	2388.6
Labor Force Participation:		
single women	0.910	0.895
single men	0.960	0.963
married women	0.662	0.693
married men	0.983	0.997
Household Production without Children		
single women	473.1	407.7
single men	368.4	356.7
married women	787.7	755.5
married men	350.7	366.9
Household Production with Children		
single women	715.0	728.9
single men	449.2	356.7
married women	1357.2	1060.9
married men	368.7	364.1
Wealth		
unmarried women	8,180	9,198
unmarried men	14,149	10,228
married couples	49,732	21,276

Table 12: Policy Results: Men

	No Subsidy	EITC	LSS
Men b. Poverty Line			
LFP	0.72	0.70	0.94
Cond. Labor Supply	2306.8	2298.7	2088.6
Welfare	-3990.4	-3990.0	-3989.8
Single Men b. Poverty Line			
LFP	0.67	0.66	0.93
Cond. Labor Supply	2286.2	2277.4	2031.0
Welfare	-4001.9	-4000.8	-4000.5
Married Men b. Poverty Line			
LFP	0.996	0.993	0.994
Cond. Labor Supply	2395.2	2394.8	2391.0
Welfare	-3917.5	-3921.1	-3914.3
% Households b. Poverty Line			
Fraction below	10.6	10.7	10.1

Table 13: Policy Results: Women

	No Subsidy	EITC	LSS
Women b. Poverty Line			
LFP	0.61	0.60	0.78
Cond. Labor Supply	2293.2	2286.9	2105.8
Welfare	-3949.0	-3947.4	-3948.6
Single Women b. Poverty Line			
LFP	0.64	0.63	0.83
Cond. Labor Supply	2302.6	2295.8	2113.1
Welfare	-3955.0	-3952.2	-3952.8
Married Women b. Poverty Line			
LFP	0.16	0.16	0.19
Cond. Labor Supply	1843.8	1840.7	1748.2
Welfare	-3875.9	-3871.8	-3873.4
% **Households b. Poverty Line**			
Fraction below	10.6	10.7	10.1

Figure 1: PSID 1968-1996, Women's Labor Supply Before and During Marriage.

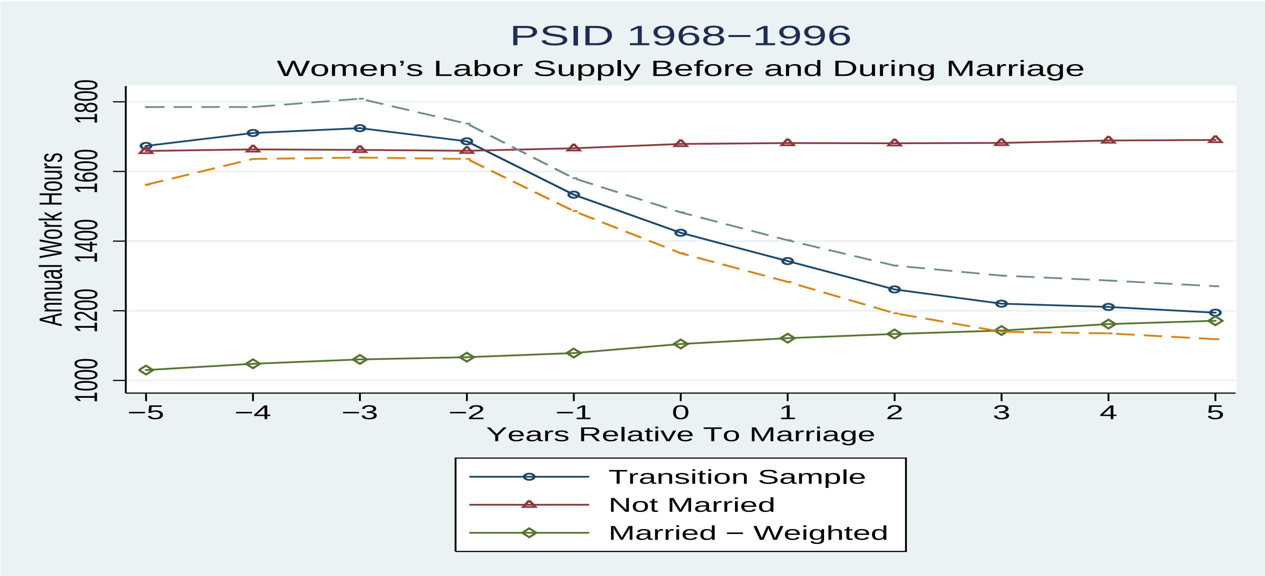

Figure 2: PSID 1968-1996, Men's Labor Supply Before and During Marriage.

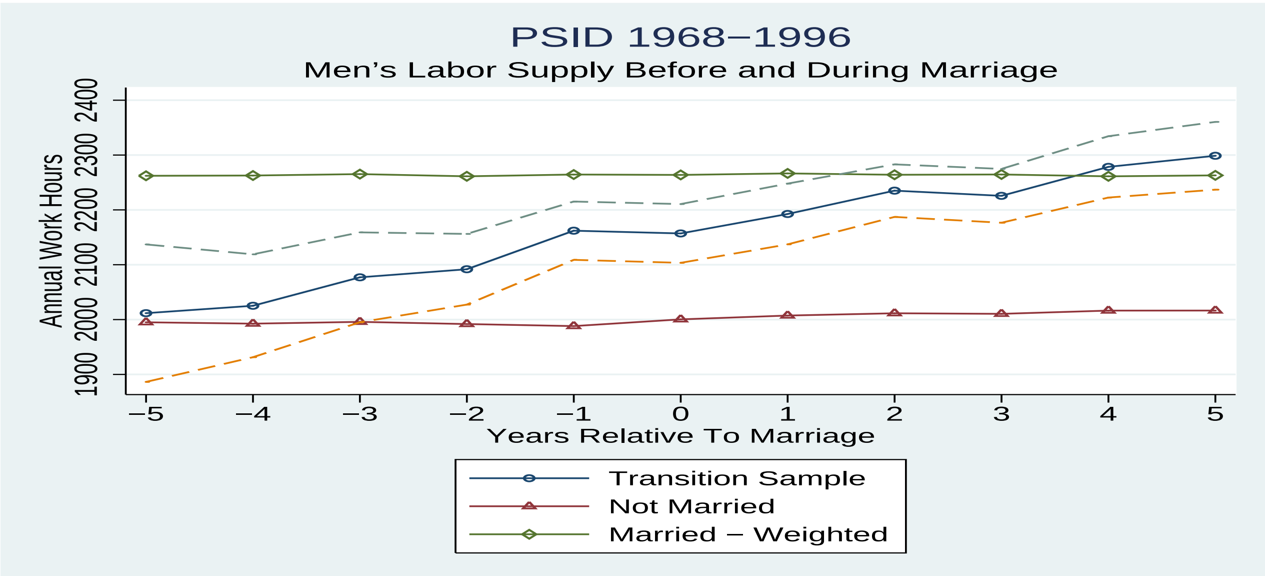

Figure 3: PSID 1968-1996, Women's Labor Supply Conditional on Working Before and During Marriage.

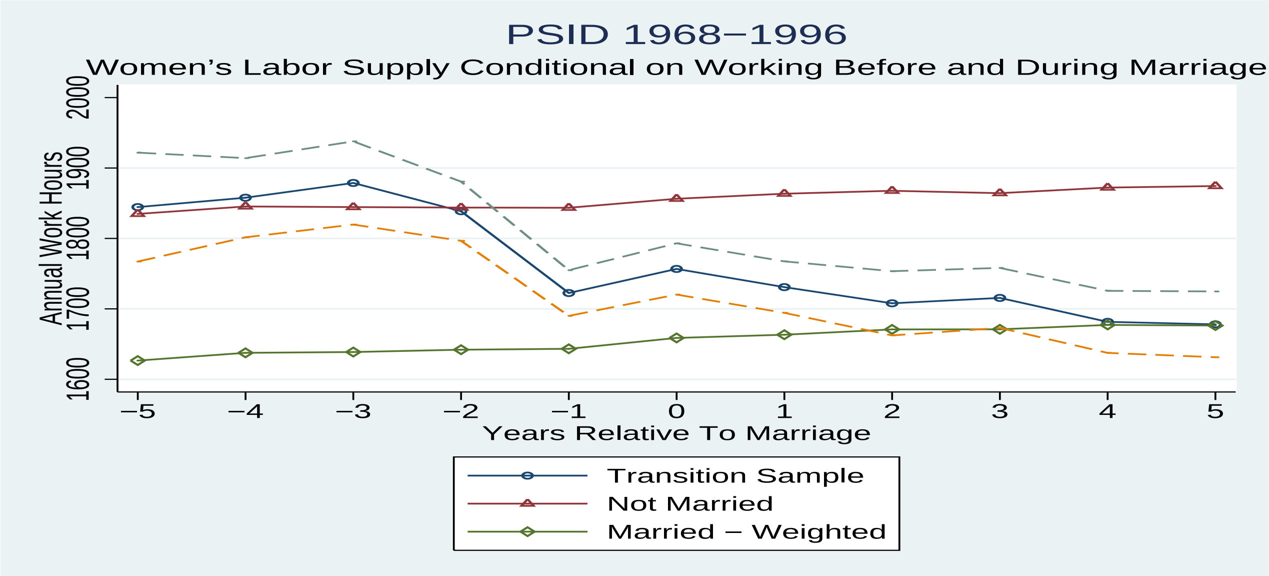

Figure 4: PSID 1968-1996, Men's Labor Supply Conditional on Working Before and During Marriage.

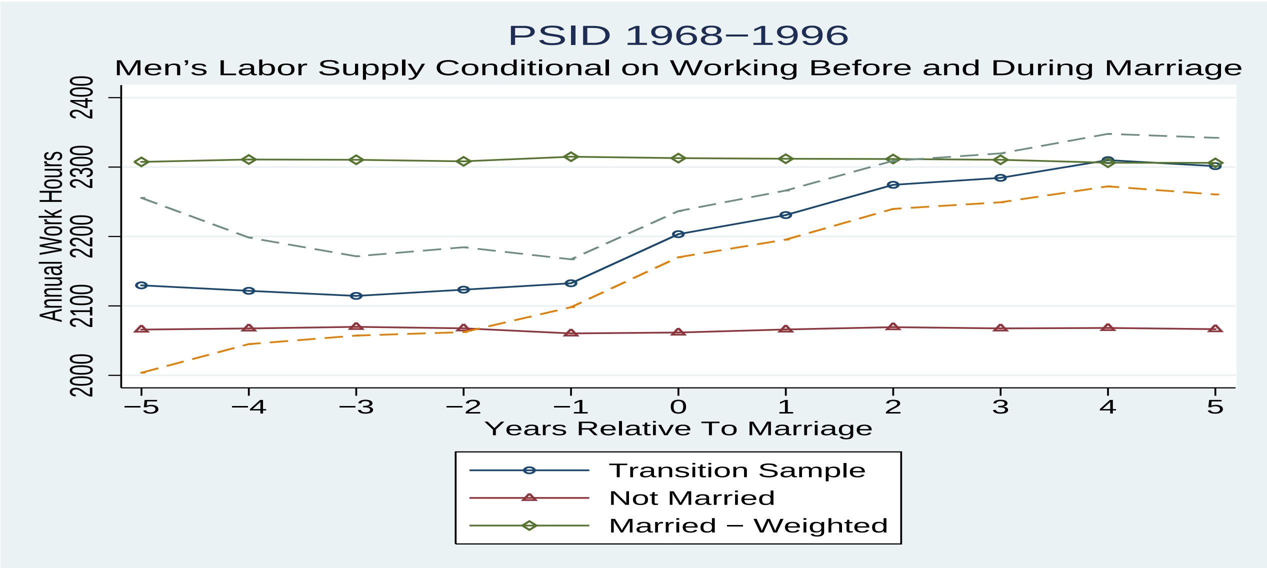

Figure 5: PSID 1968-1996, Women's LFP Before and During Marriage.

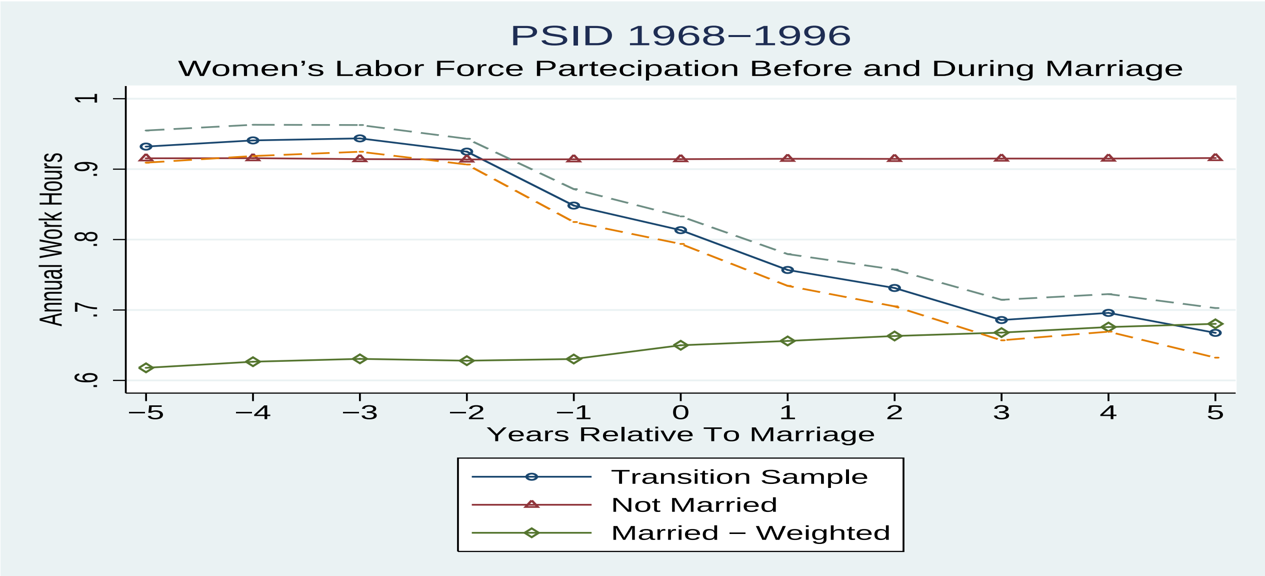

Figure 6: PSID 1968-1996, Men's LFP Before and During Marriage.

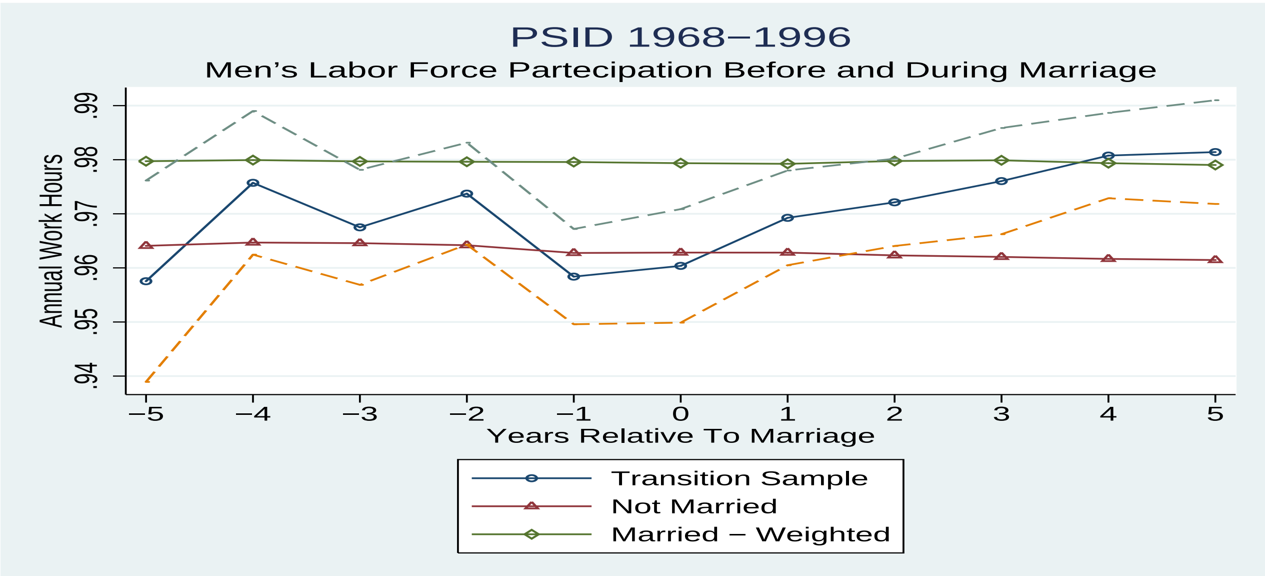

Figure 7: PSID 1968-1996, Women's Household Production Hours Before and During Marriage.

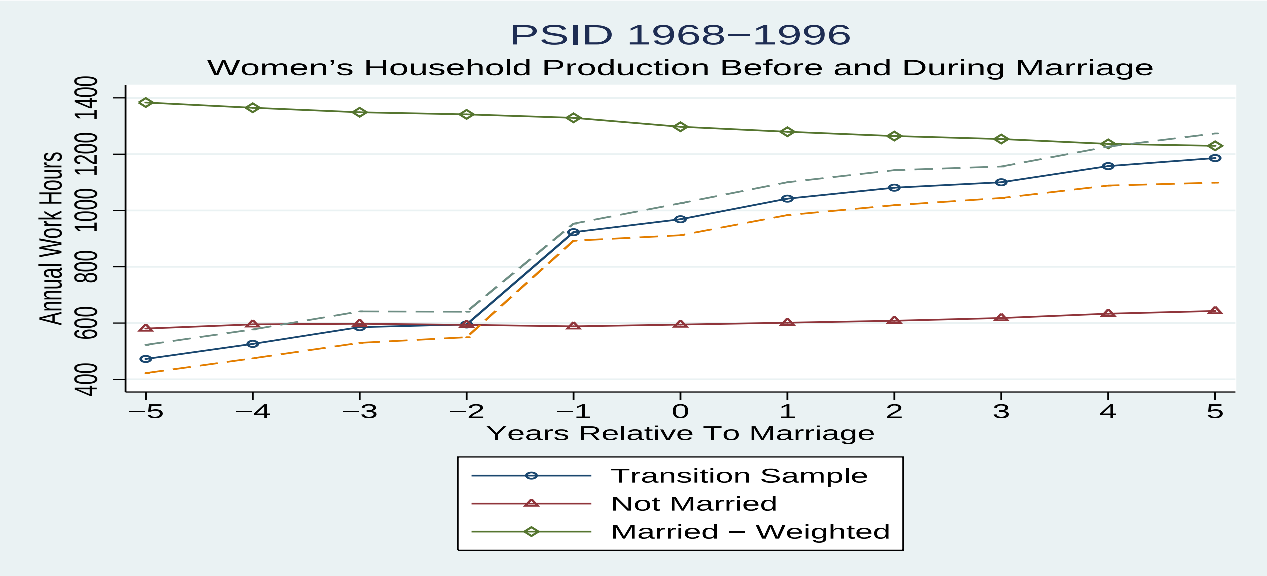

Figure 8: PSID 1968-1996, Men's Household Production Hours Before and During Marriage.

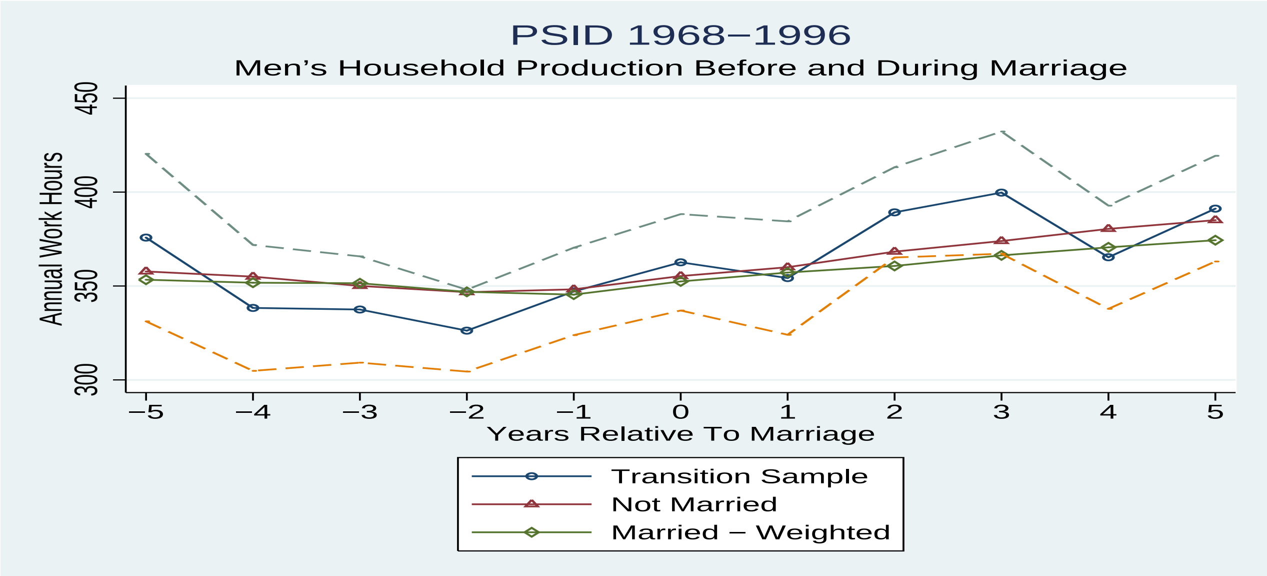

Figure 9: PSID 1968-1996, Women's LS Before and After First Birth.

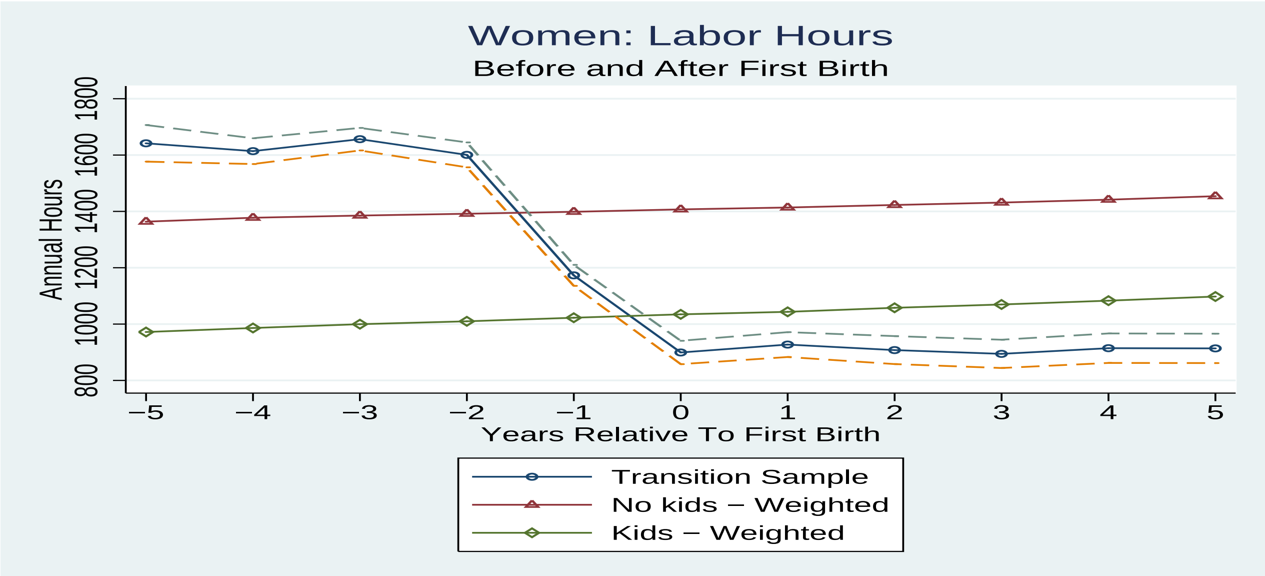

Figure 10: PSID 1968-1996, Men's LS Before and After First Birth.

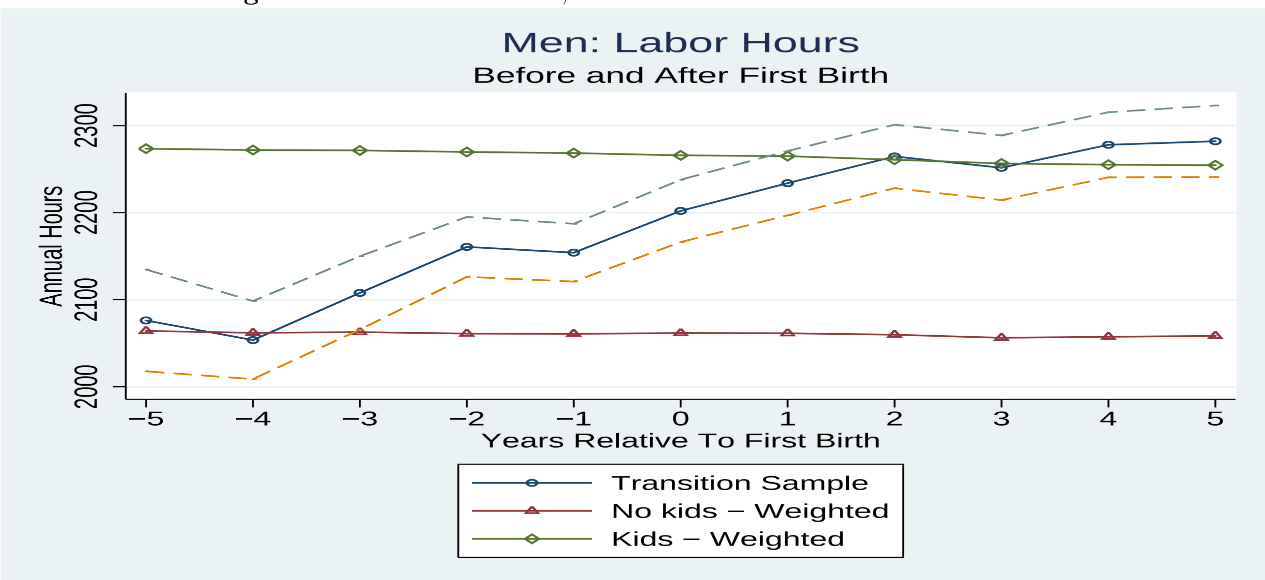

Figure 11: PSID 1968-1996, LS of Women with no Children.

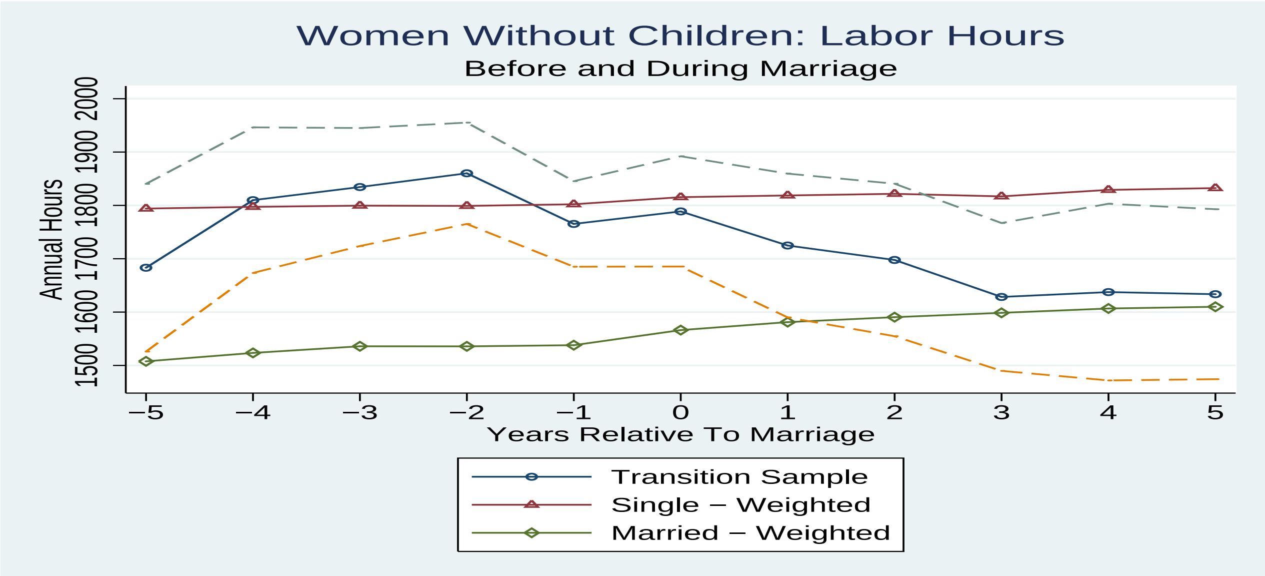

Figure 12: PSID 1968-1996, LS of Men with no Children.

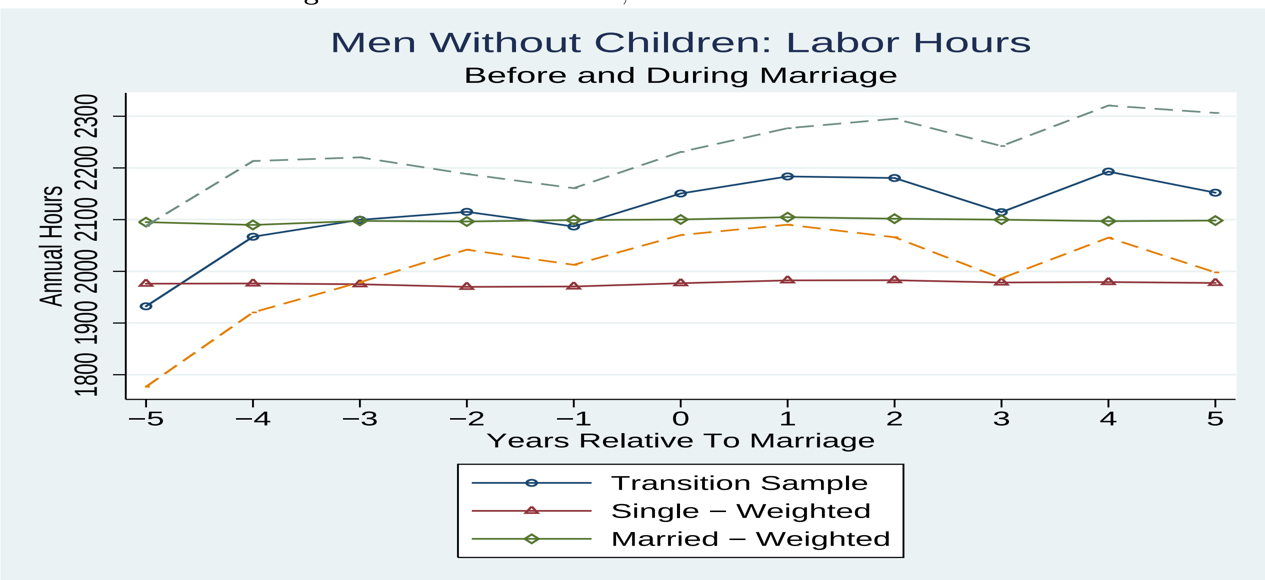

Figure 13: PSID1968-1996, Residual LS of Women without Children.

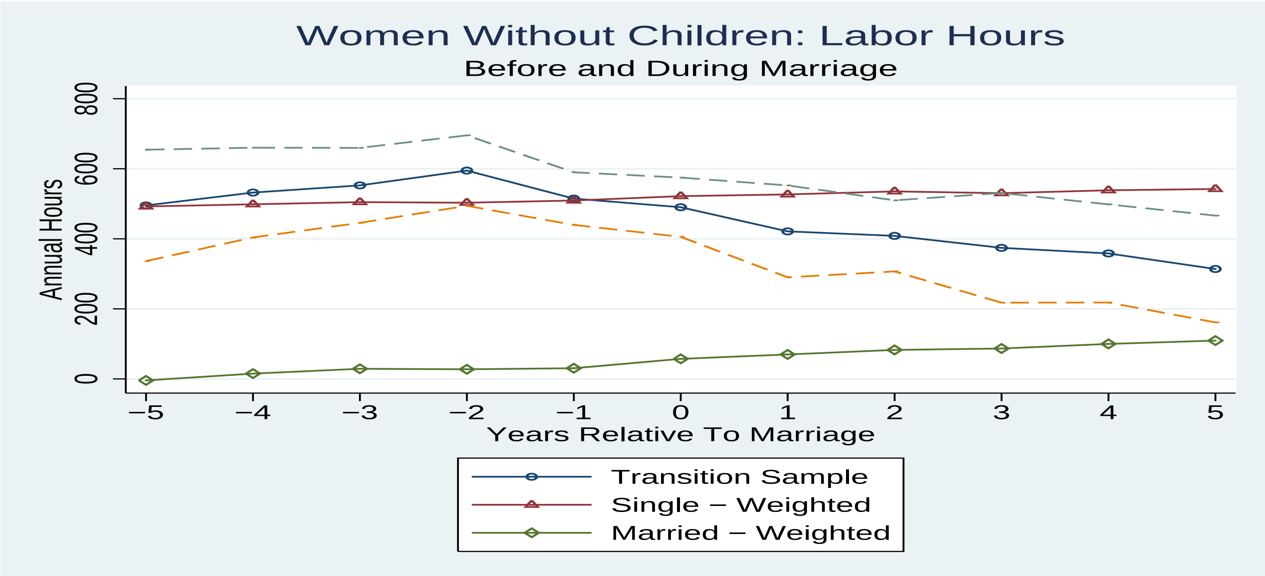

Figure 14: PSID 1968-1996, Residual LS of Men without Children.

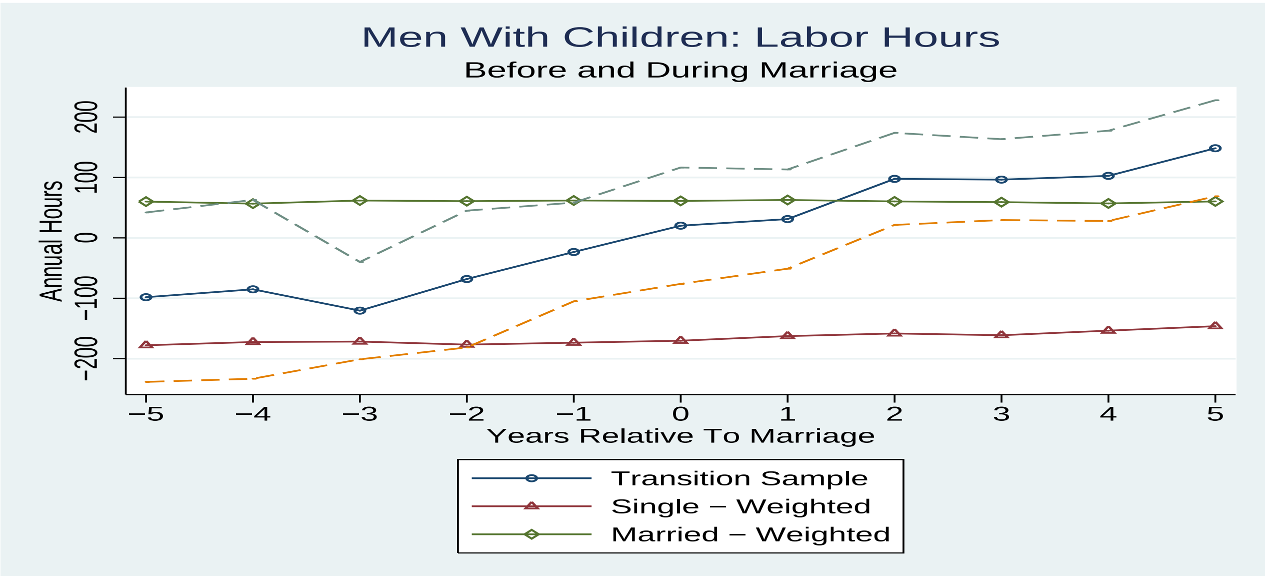

Figure 15: PSID 1968-1996, Women's Labor Supply Before and After Divorce.

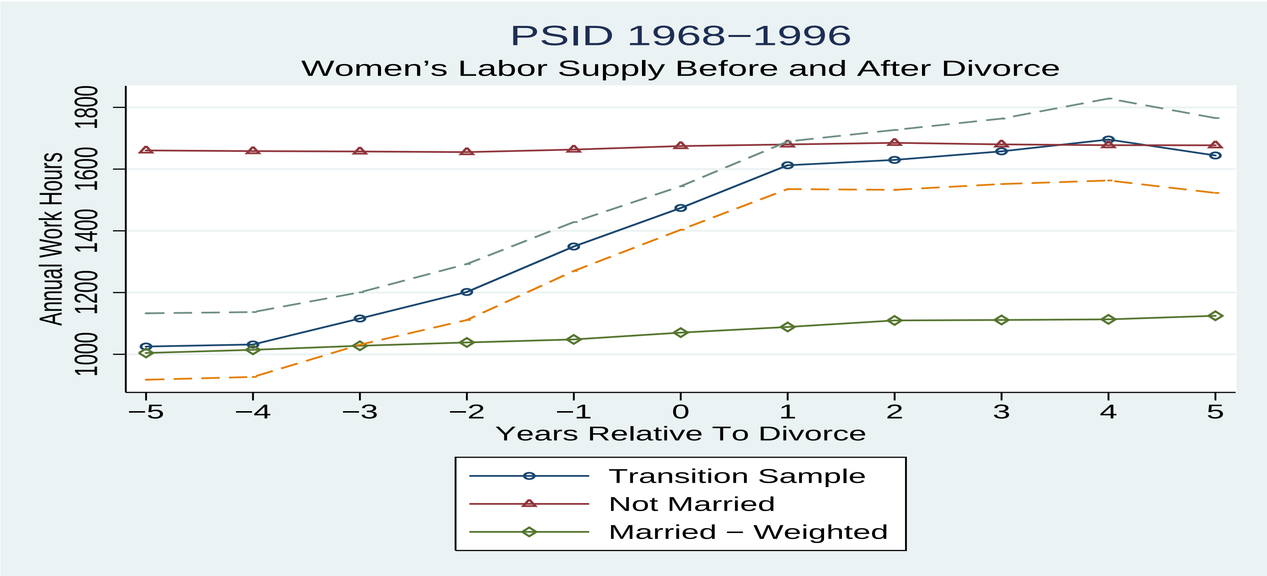

Figure 16: PSID 1968-1996, Men's Labor Supply Before and After Divorce.

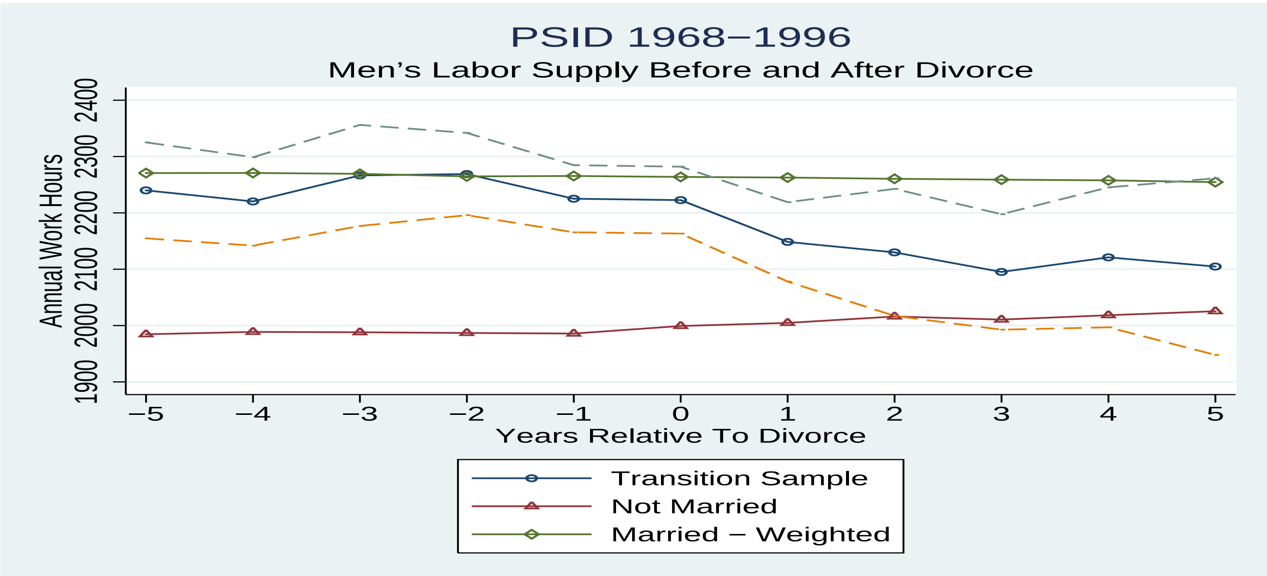

Figure 17: PSID 1968-1996, Women's Household Production Before and After Divorce.

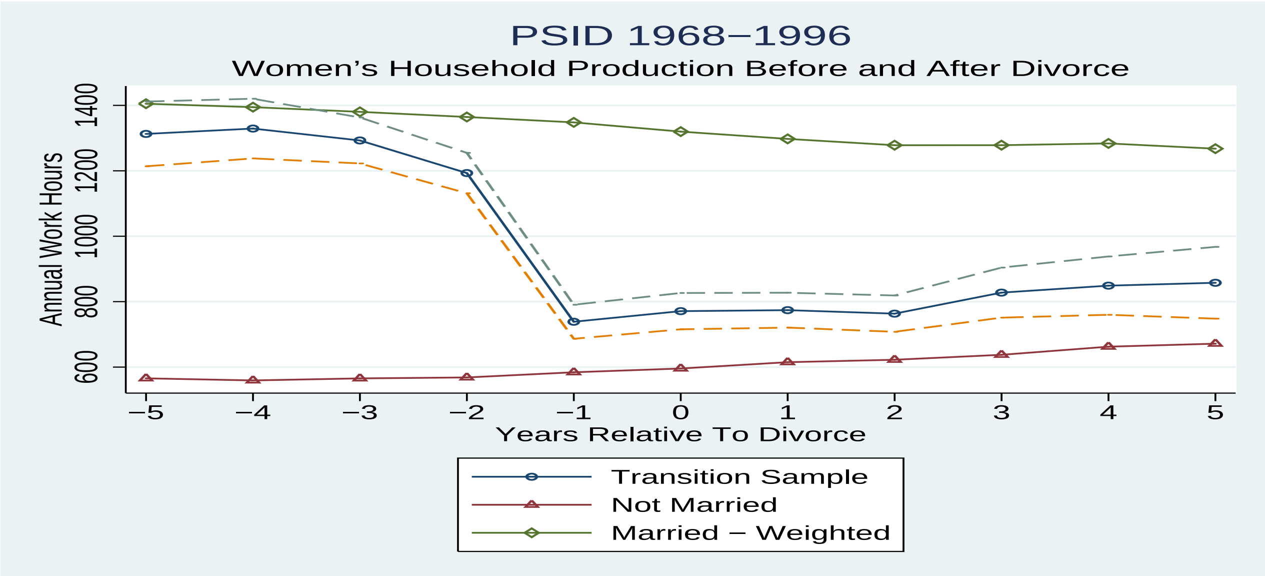

Figure 18: PSID 1968-1996, Men's Household Production Before and After Divorce.

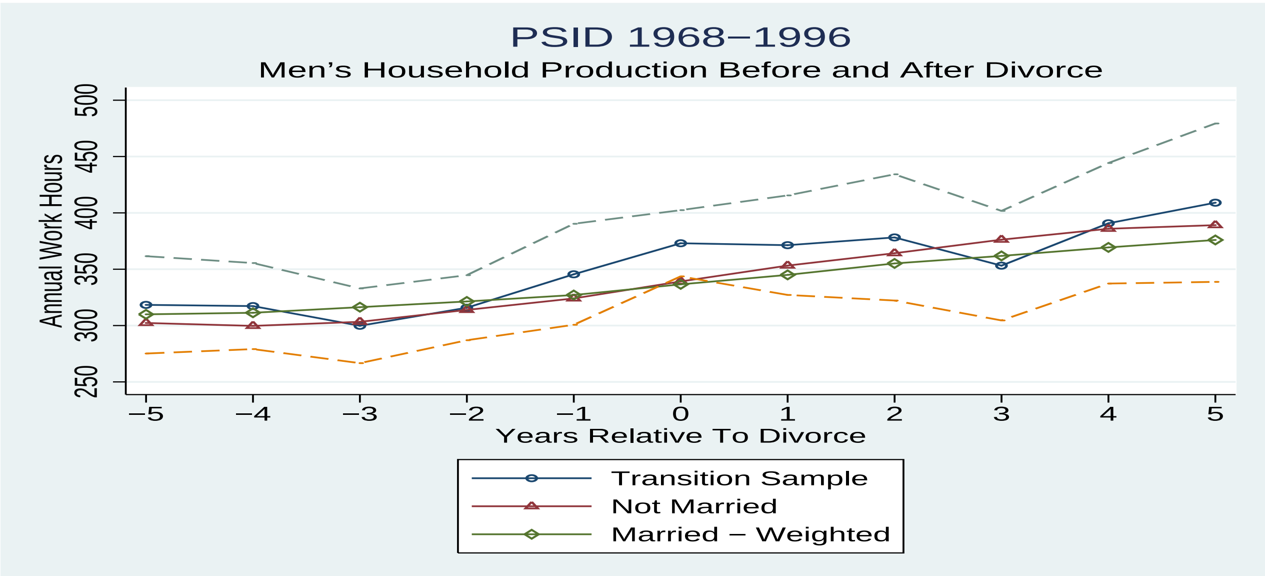

Figure 19: Simulation, Women's Labor Supply Before and During Marriage.

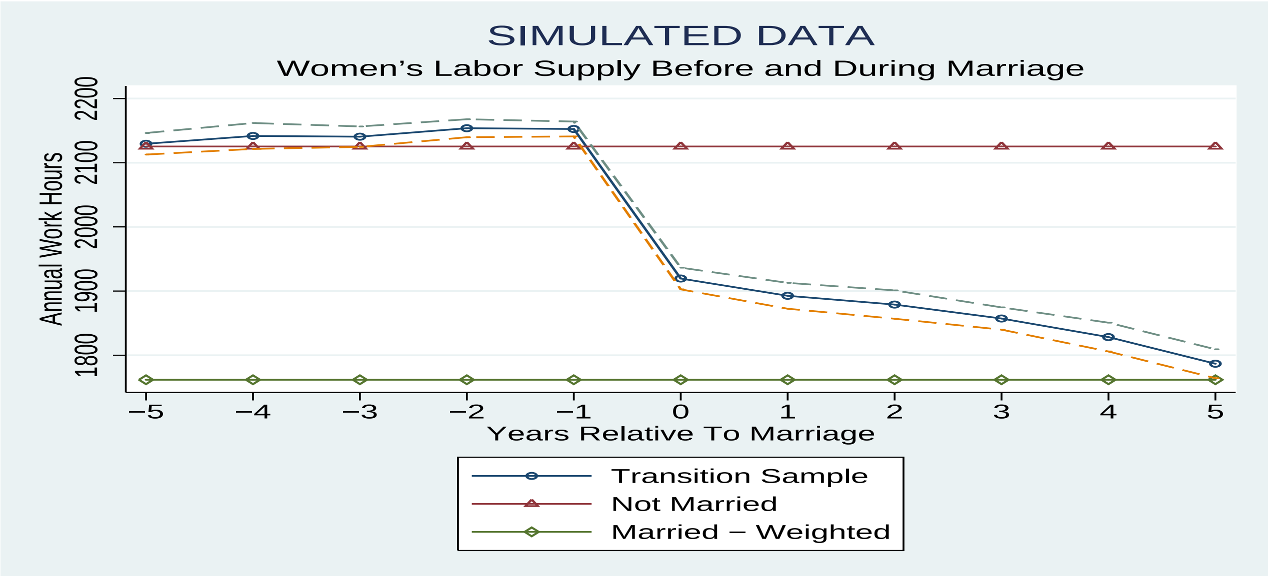

Figure 20: Simulation, Men's Labor Supply Before and During Marriage.

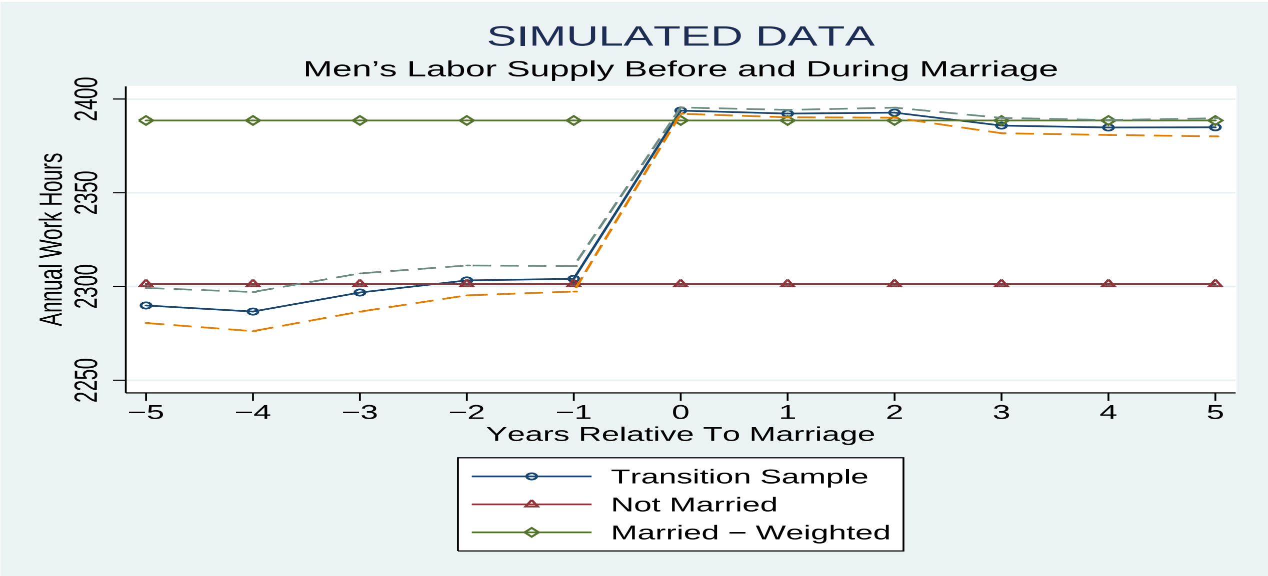

Figure 21: Simulation, Women's LFP Before and During Marriage.

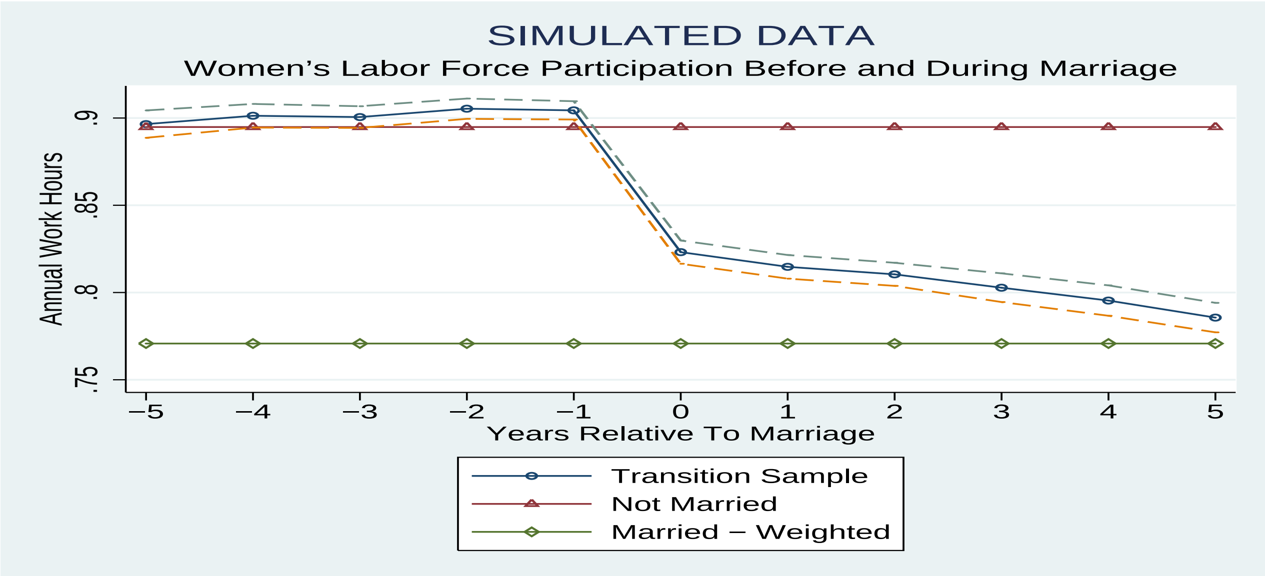

Figure 22: Simulation, Men's Labor Supply Before and During Marriage.

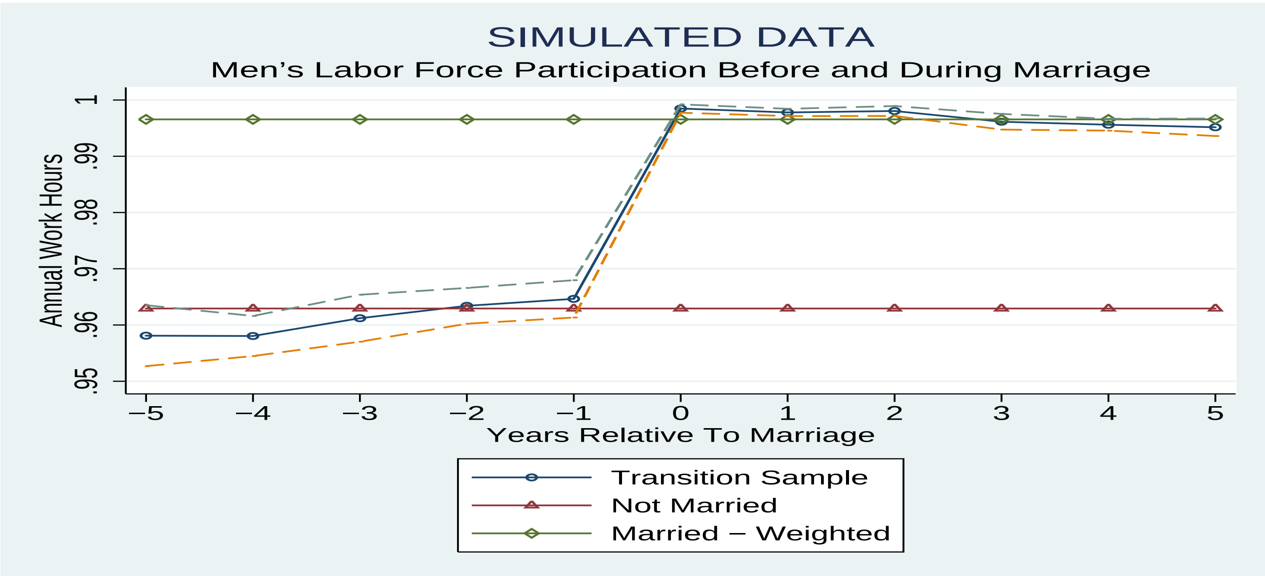

Figure 23: Simulation, Women's Labor Supply Conditional on Working Before and During Marriage.

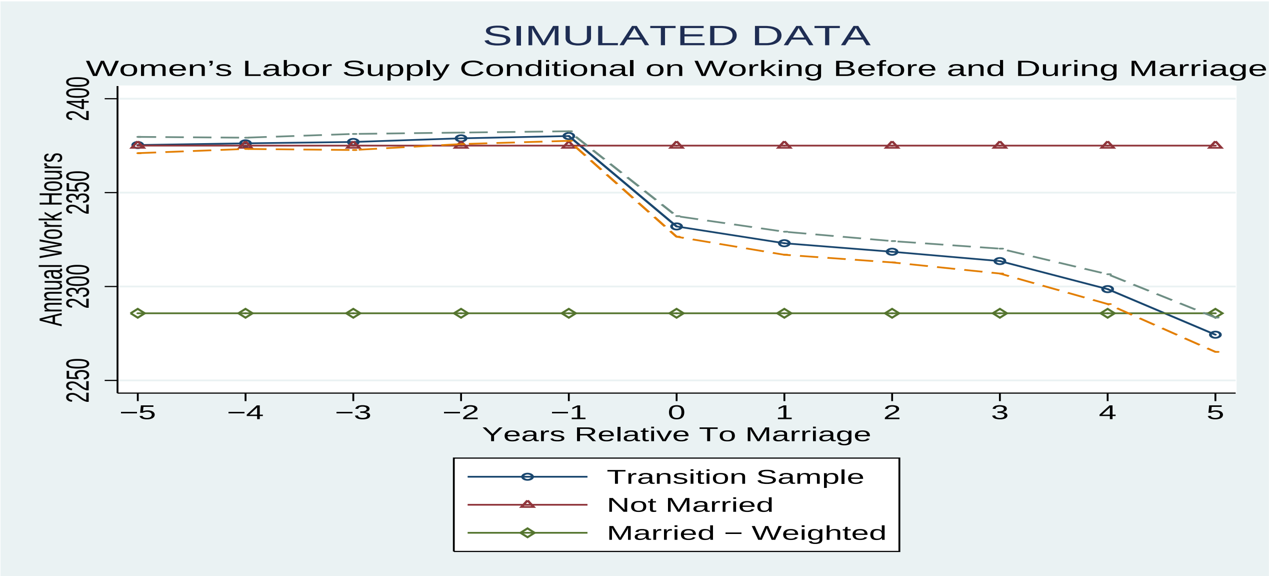

Figure 24: Simulation, Men's Labor Supply Conditional on Working Before and During Marriage.

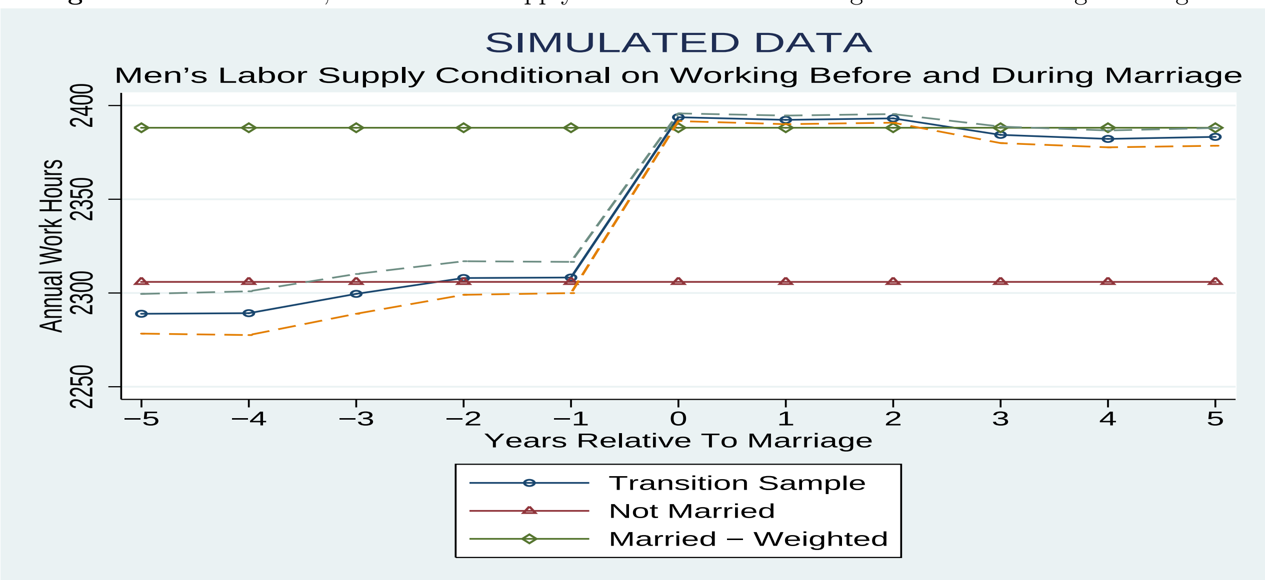

Figure 25: Simulation, Women's Household Production Before and During Marriage.

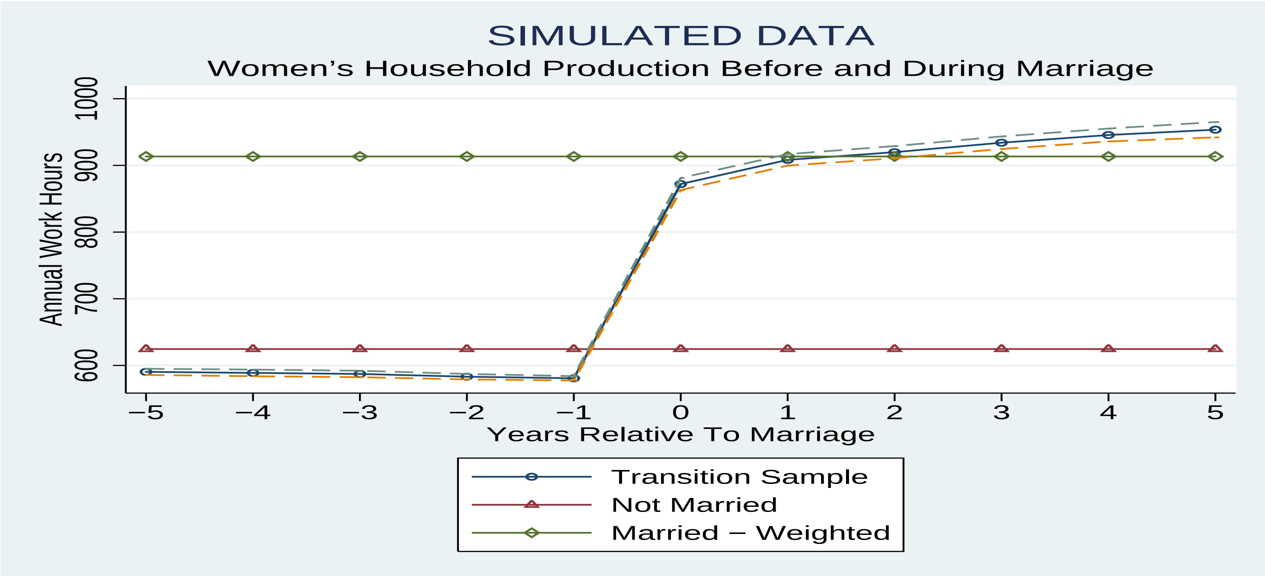

Figure 26: Simulation, Men's Household Production Before and During Marriage.

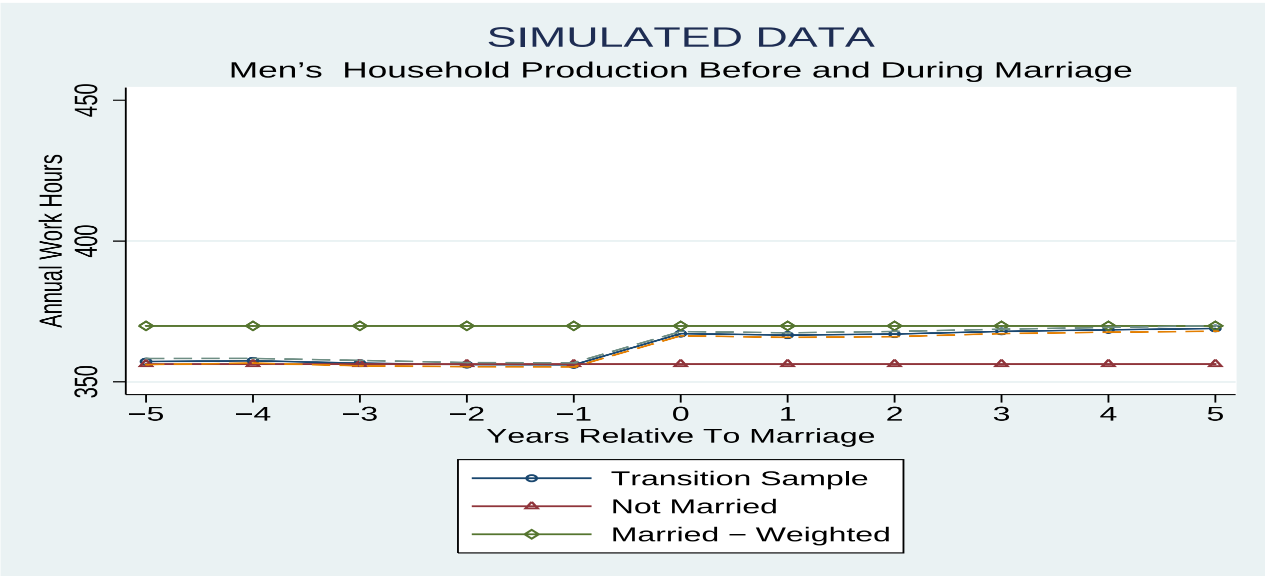

Figure 27: Simulation, Women's Labor Supply Before and After Divorce.

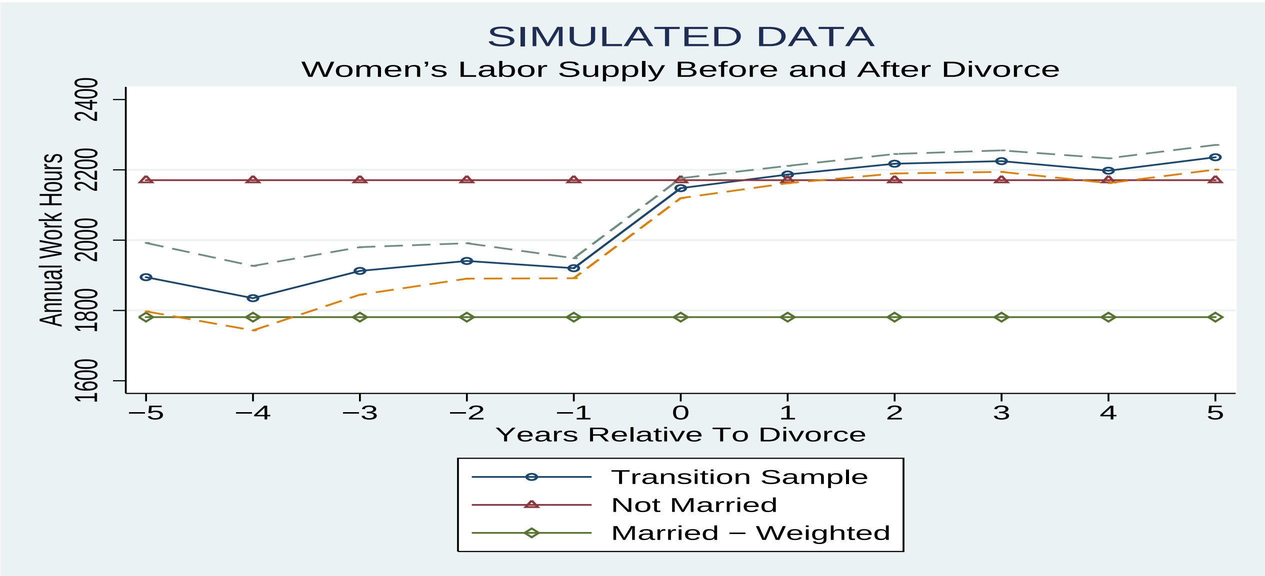

Figure 28: Simulation, Men's Labor Supply Before and After Divorce.

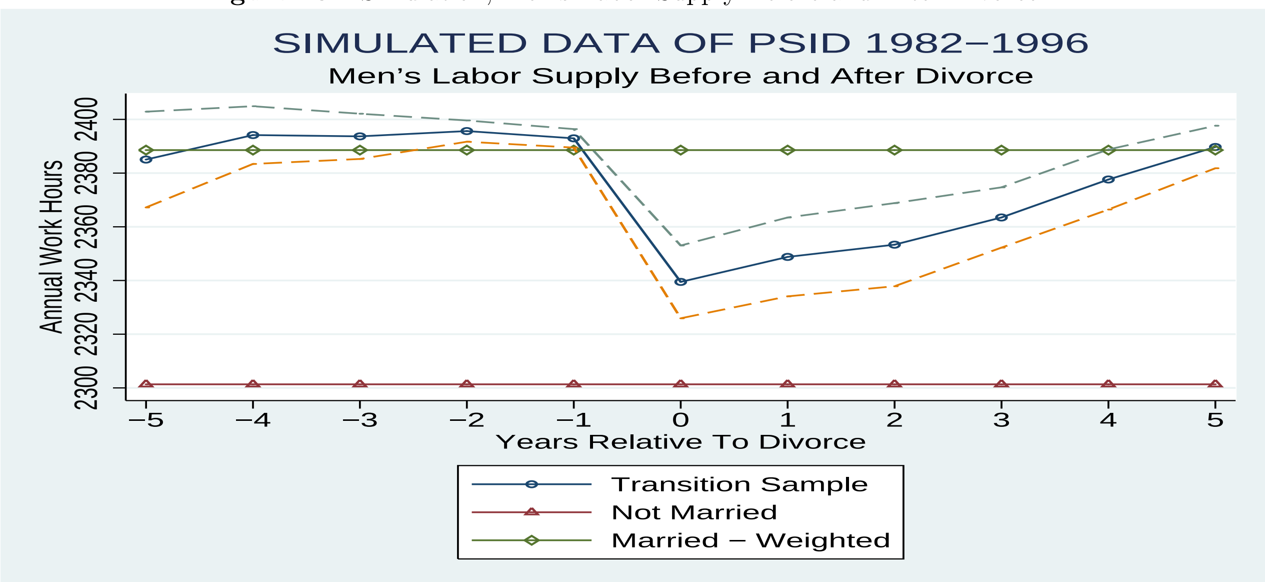

Figure 29: Simulation, Women's Conditional Labor Supply Before and After Divorce.

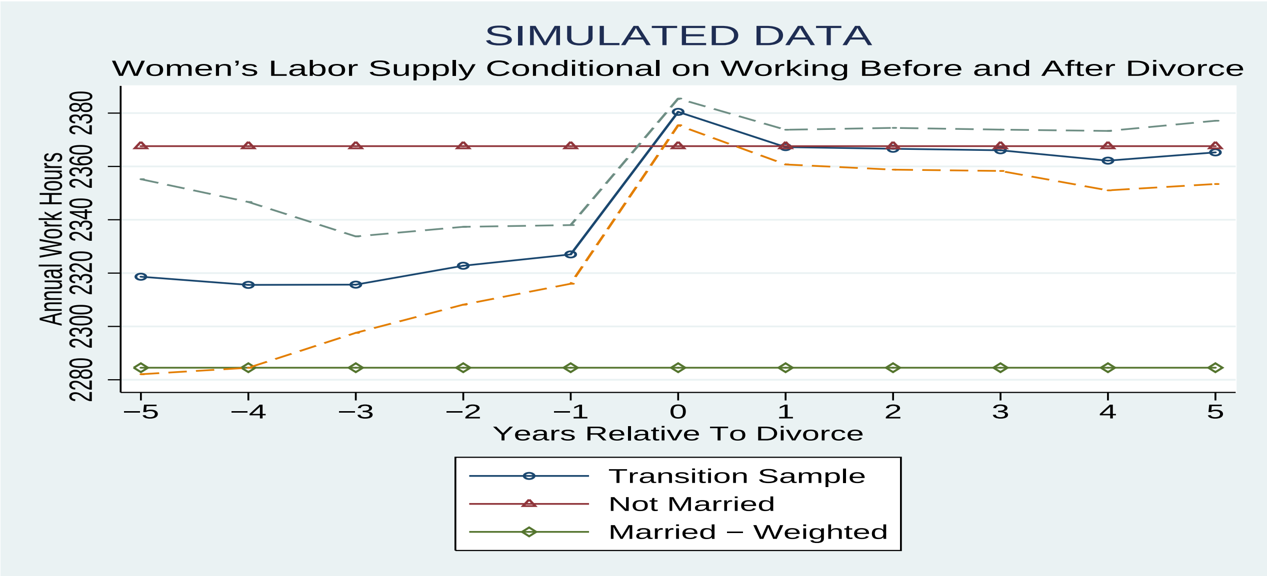

Figure 30: Simulation, Women's Labor Force Participation Before and After Divorce.