

**When Homemakers are Compensated: a Test of Household Models under Alternative  
Divorce Regimes<sup>§</sup>**

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**Abstract**

The liberalization of divorce laws has reduced the commitment value of marriage. I examine the effects of the homemaking provision in family law that gives recognition to the contribution of homemakers in marriage in the division of marital properties at divorce under alternative divorce regimes. I develop a non-cooperative household model to analyze the effects of the provision on spousal behavior. The empirical findings show that spousal behavior is consistent with this non-cooperative framework under liberalized divorce regimes and the homemaking provision is found to increase wife's performance of housework and reduce their market labor supply in unilateral divorce states.

Keywords: divorce law, homemakers, marriage, household specialization, housework, labor supply, property division

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## 1. Introduction

The financial distress faced by divorced homemakers in the United States since the unilateral divorce reform in the 1970s has been well documented (see Weitzman 1985; Parkman 2000). This is largely a result of the failure of the unilateral divorce law in accounting for the impaired market earning capacities of homemakers, and their nonmonetary contribution to marriage in property division and awarding alimony at divorce. In the old days when divorce requires mutual consent, the divorce settlement was typically negotiated so that the wife, who was usually the one that specialized in home production during marriage, was in a better bargaining position.

The potential financial distress of homemakers in divorce state coupled with easy divorce has weakened household gender specialization, as the incentive for couples to coordinate their investment in market and marriage-specific human capital and time allocation falls (Johnson & Skinner 1986; Parkman 1992). Mazzocco (2007) used British data from 1982-1995 to test the hypothesis that household members can commit to future allocations of resources and his empirical findings strongly reject this hypothesis.<sup>1</sup>

Traditionally members within a family have been assumed to behave as a joint unit or cooperatively in the economics literature. This includes the Becker's (1981) unitary model which assumes that individual family members pool their income to maximize one 'consensus' family utility function. The bargaining models of marriage (Manser & Brown 1980; McElroy & Horney 1981; Lundberg & Pollak 1993) and collective approach of Chiappori (1988, 1992) move one step further to allow for spouses to have different utility functions; yet all these assume the outcomes of the decision process to be always efficient.

Aside from the theoretical convenience in imposing Pareto efficiency in household models, the justification for adopting such assumption in marriage is that marriage is usually viewed as a long-lasting relationship between spouses, and so they have strong incentives to act cooperatively to achieve an efficient outcome. This argument however is questionable when any spouse can walk out of the marriage at ease with liberalized divorce laws, which has made it very costly for spouse to make binding agreement regarding future behavior and investments that are worth less outside marriage (Lundberg 2008). Couples might behave strategically when for

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<sup>1</sup> The United Kingdom introduced unilateral divorce in 1971 (González & Viitanen 2009). Therefore it is possible that finding of the lack of commitment to future allocations is linked with unilateral divorce.

example their time allocation in marriage could affect their future earning opportunities (Weiss 1997; Lundberg 2008). Even for countries where divorce is rare, intra-household allocation might still not necessarily be Pareto efficient (Udry 1996).

In this paper, I use a non-cooperative household model to analyze spousal time allocation and investment in public goods in view of the changes in divorce law that arguably have reduced commitment to marriage, which makes cooperation prohibitively costly to sustain for some spouses. Whether and to what extent the liberalization of divorce laws has altered intra-household spousal cooperation is an empirical question. I study the effect of a law that gives recognition to home production in property division at divorce, which I refer to as the “homemaking provision” on the time allocation within married households. I examine the differential effects of this homemaking provision under different sets of liberalized divorce laws as a test of the appropriate household model under alternative divorce regimes.

To interpret this law with more precision: the homemaking provision at divorce under study refers to a statute created in some states or established case law under the common law regime that gives recognition to the contribution of a spouse as a homemaker in property division at divorce (see Wong 2016 for details of the development of the homemaking provision).<sup>2</sup> Although ultimately it is at the discretion of the court to interpret the provision and to decide

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<sup>2</sup> The actual statute can vary slightly across states. The following are the relevant portions of the property division statutes from Arkansas and Montana to illustrate the homemaking provision in the statutes:

**Arkansas**

(A) At the time a divorce decree is entered:

(1) All marital property shall be distributed one-half (1/2) to each party unless the court finds such a division to be inequitable, in which event the court shall make some other division that the court deems equitable taking into consideration (1) the length of the marriage; (2) age, health, and station in life of the parties; (3) occupation of the parties; (4) amount and sources of income; (5) vocational skills; (6) employability; (7) estate, liabilities, and needs of each party and opportunity of each for further acquisition of capital assets and income; (8) contribution of each party in acquisition, preservation, or appreciation of marital property, including services as a homemaker, and (9) the federal income tax consequences of the Court's division of property. When property is divided pursuant to the foregoing considerations the court must state its basis and reasons for not dividing the marital property equally between the parties and such basis and reasons should be recited in the order entered in said matter.

Ark. Stat. Ann. § 34-1214(A)(1) (Cum. Supp. 1985)

**Montana**

In making apportionment, the court shall consider the duration of the marriage and prior marriage of either party; the age, health, station, occupation, amount and sources of income, vocational skills employability, estate liabilities, and needs of each of the parties; custodial provisions; whether the apportionment is in lieu of or in addition to maintenance; and the opportunity of each for future acquisition of capital assets and income. The court shall also consider the contribution or dissipation of value of the respective estates and the contribution of a spouse as a homemaker or to the family unit.

Mont. Code Ann. § 40-4-202(1) (1987)

how much additional property would be allocated to the homemakers at divorce out of such provision, the homemakers are of no doubt better protected by the provision as the rights of the homemakers to the marital property become more clearly delineated than without it. In Wong (2016), I found that the homemaking provision has substantially increased marriage rates and the effects appear to concentrate among unilateral divorce states.

The homemaking provision in divorce law has been quite extensively discussed in the law literature in the past decades (see Fineman 1989; Brown & Viken 1990; Starnes 1993). Quite surprisingly, its social and economic impacts have rarely been studied by economists and sociologists. Stevenson (2008) hints at the potential economic impact of the homemaking provision in divorce law. And to the best of my knowledge, none had attempted to provide a comprehensive empirical investigation on how the homemaking provision would affect the division of labor within the household. Much is to be gained from an investigation into how and to what extent this homemaking provision influences time allocation of spouses and whether these changes in household behaviors are linked with the liberalization of divorce laws.

This paper contributes to the literature on the change in divorce law on household behavior. The existing literature primarily focuses on the discussion on the impact of unilateral divorce on divorce rates (see Peters 1986; Allen 1992, 2002; Friedberg 1998; Wolfers 2006) and how the unilateral reform and changes in the rules governing property division at divorce affects family outcomes such as spousal labor supply and housework performed, investment in marriage specific capital and home ownership (Gray 1998; Roth 2017; Stevenson 2007, 2008). This paper examines how the unilateral divorce law might have impaired cooperation within married households and how a law that gives recognition to home production could induce more beneficial household specialization given the legal changes.

I make use of the time variation of the adoption of the provision across states to identify the causal effects of the homemaking law on spousal behavior. The empirical analysis makes use of variety sources of data. I collect data on the timing of the introduction of the homemaking provision across states based on the state statutes and established case law. I use 30 waves of the Panel Study of Income Dynamics (PSID) from 1968-1997 to perform an individual fixed-effect analysis on the effect of the homemaking provision on time allocation of wives.

My findings show that for households that reside in unilateral divorce states, this law has encouraged home production and reduced labor supply of wives that married prior to the reform. The findings in the paper offer evidence that the liberalization in divorce laws in the United States is associated with reduced co-operation among spouses in decisions that would affect their wellbeing in divorce, as they could not credibly commit to future allocations of resources; and the homemaking provision enhances household specialization in states with liberalized divorce laws, as it legally recognizes the contribution made by homemakers in marriage in dividing properties and assets at divorce.

## **2. Theoretical Framework**

The parallels between firms and households have been highlighted by Becker (1981), Grossbard-Shechtman (1984, 1993), Grossbard-Shechtman & Lemennicier (1999) and Grossbard (2015). Based on Grossman and Hart (1986) and Hart and Moore (1990) (henceforth GHM), I develop a simple model of marriage in which spouses choose their public goods investment decisions non-cooperatively. In the standard GHM setting, they study the optimal ownership allocation and investment decision under incomplete contracts: when it is costly to list all specific rights over assets in the contract. In situation when there exists some firm-specific investment that is non-verifiable by an outside party, ex-ante investment in firm-specific capital is lower than the first best level as firms renegotiate ex-ante over the surplus produced by such capital ex-post. In my model, the ex-ante non-verifiable investment includes two forms of public goods: One is home assets which have high market value and are non-marital specific. The other form is the performance of domestic duties, which are marriage-specific and have lower market value in singlehood.<sup>3</sup>

One reason for the possibility of inefficiency in public good provisions in families is the limit in couples' ability in writing complete marital contracts that specify intra-household allocation of family resources contingent on their financial and non-financial contribution to the family. In

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<sup>3</sup> The application of the GHM framework into the study of marriage has been adopted by Rasul (2006) in optimal custody allocation. In his work spouses decide on investments in child quality during marriage based on the custody allocation that is assumed to be fixed before couples marry. The custody allocation under this setting would produce both distributional and efficiency consequences as it determines the share of marital surplus each spouse appropriates in marriage. Konrad and Lommerud (2003) also study the human capital investment decision of couples in a non-cooperative framework. Spouses first invest in their education non-cooperatively while the day-to-day allocation of time is determined at a later stage through Nash-bargaining with the non-cooperative behavior as the fall-back position.

addition, these contracts are non-binding and unenforceable in court as the state usually does not interfere with the private sphere of individuals unless the marriage actually dissolves.

Admittedly in reality it is not reasonable to expect that all couples behave non-cooperatively in their time allocation and roles in the family. But as long as liberalized divorce laws cause *more* spouses to behave non-cooperatively within marriage, the homemaking law would produce effect on these marginal couples. Iyigun (2009) constructed a marital sorting model where individuals' marital preferences and commitment costs vary. In his model, some married couples cooperate efficiently but with limited commitment some act non-cooperatively. He also shows that more married couples will choose to act non-cooperatively if the gain from marriage falls and commitment costs rise. If the unilateral divorce exogenously increases spousal marital commitment costs, more couples would behave non-cooperatively in his model.

### A. The Model

The household consists of a wife (f) and a husband (m). Spouse  $i$ 's utility function is quasi-linear and is given by:

Utility of spouse in marriage:

$$U_i^M = v_i(G_1) + G_2 \tag{1}$$

where  $G_1$  represents home assets which are household public goods that are durable and have resale value.  $G_2$  represents domestic duties that are assumed to be public goods within a household.  $v_i$  is concave and twice differentiable.<sup>4</sup>

It is assumed that the contribution of the wife and the husband are substitutes in the production of the public goods. The production technology of the home assets and domestic public goods are given respectively by:

$$G_1 = g_m + g_f \tag{2}$$

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<sup>4</sup> The main results do not rely on the assumption of linearity in  $G_2$ .

$$G_2 = \gamma_m f(l_m) + \gamma_f f(l_f) \quad (3)$$

where  $g_i$  denotes spouse  $i$ 's investment in home assets;  $\gamma_i$  stands for the efficiency of spouse  $i$  in the production of the domestic public goods.  $f(l_i)$  is a concave function.

Spouse  $i$ 's time constraint:

$$l_i + h_i = 1 \quad (4)$$

where  $l$  denotes time spent on domestic duties;  $h$  denotes market labor. The total amount of time available to each spouse is normalized to 1.

Spouse  $i$ 's budget constraint:

$$w_i h_i = g_i \quad (5)$$

where  $w$  stands for the market wage; The price for the home assets is normalized to 1.

Utility of the wife in divorce:

$$U_f^D = v_f[\alpha(g_m + g_f)] + \theta \gamma_f f(l_f) \quad (6)$$

Utility of the husband in divorce:

$$U_m^D = v_m[(1 - \alpha)(g_m + g_f)] + \theta \gamma_m f(l_m) \quad (7)$$

(6) assumes that domestic work is worth less in divorce state which is given by the condition  $0 \leq \theta < 1$ . One justification as suggested by Lundberg (2008) is that domestic skills are usually

marriage-specific and have little value in single life. Also domestic work is not generously remunerated in the market (see England and Folbre 1999).  $\alpha$  represents the portion of the home assets that is allocated to the wife at divorce.<sup>5</sup>

### **B. Timing of the Non-cooperative Game**

Couples in this model behave non-cooperatively, which can be a result of that they cannot credibly commit to future allocations. This setting is particularly applicable to unilateral divorce regimes because divorce can be obtained on demand by either spouse which hinder cooperation in marriage.<sup>6</sup> The timing of events is as follows:

In period one, the spouses decide how much time to be allocated to domestic duties and labor work non-cooperatively. The domestic duties are public goods in marriage. The wage income they receive is spent on investment in home assets. To focus on how the decisions of these two major forms of public goods in families are affected by the homemaking law, I do not consider private consumption in my model. It is assumed that the cost for spouses to write a marital contract that specifies ex-ante the marital surplus each party would get based on their amount of contribution to homemaking and the home asset is prohibitively high.

In the second period, divorce occurs exogenously with probability  $\beta$  where  $0 \leq \beta \leq 1$ . In the state where couples remain married, they share the public goods. In the divorce state, they keep their own part of public goods generated from time allocated to domestic duties but the home asset will be split according to the law governing property division at divorce and the proportion shared by the wife is given by  $\alpha$ .

### **C. The Non-cooperative Game**

Assume that when it is efficient to keep the marriage, so that the payoff of the wife is given by:

$$U_f^M = v_f(g_m + g_f) + \gamma_m f(l_m) + \gamma_f f(l_f) \tag{8}$$

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<sup>5</sup> So under standard community property law and strict common law,  $\alpha = \frac{1}{2}$  and  $\frac{g_f}{(g_f + g_m)}$  respectively.

<sup>6</sup> The first best benchmark case and the non-cooperative model without the homemaking provision are discussed in Appendix A.



And if divorce occurs, the wife gets:

$$U_f^D = v_f(\alpha(G_1)) + \theta\gamma_f f(l_f) \quad (9)$$

Therefore the total expected payoff for the wife is given by:

$$(1 - \beta)\{v_f(g_m + g_f) + \gamma_m f(l_m) + \gamma_f f(l_f)\} + \beta[v_f(\alpha(G_1)) + \theta\gamma_f f(l_f)] \quad (10)$$

To focus on the effect of the homemaking provision on resource allocation, assume that the utility functions for the wife and husband are identical, so the total expected payoff is given by:

$$(1 - \beta)\{v(g_m + g_f) + \gamma_m f(l_m) + \gamma_f f(l_f)\} + \beta[v((1 - \alpha)(G_1)) + \theta\gamma_m f(l_m)] \quad (11)$$

Eliminating the market labor supply using the time constraint and then substituting out the home assets, the first order condition for the time the wife allocates to housework is given by:

$$(1 - \beta)\gamma_f f'(l_f) + \beta[\theta\gamma_f f'(l_f)] = (1 - \beta)[v'(g_m + g_f)w_f] + \beta[v'(\alpha(g_m + g_f))\alpha w_f] \quad (12)$$

The left hand side captures the wife's marginal benefit of increasing  $l_f$  and the right hand side is the marginal cost associated with increasing  $l_f$  which is the loss in marginal utility from not dedicating her time to market work which generates home assets. The first order condition of  $l_m$  operates in a similar fashion.

Assume now  $\alpha$  is a function of the wife's household  $\alpha(l_f)$  with  $\alpha'(l_f) >$ , the first order condition for the time the wife allocates to housework is given by:

$$(1 - \beta)\gamma_f f'(l_f) + \beta[\theta\gamma_f f'(l_f)] + \beta[v'(\alpha(g_m + g_f))\alpha'(l_f)(g_m + g_f)] = (1 - \beta)[v'(g_m + g_f)w_f] + \beta[v'(\alpha(g_m + g_f))\alpha w_f]$$

(13)

Compared with (12) there is one additional positive term on the left hand side of (13) that represents the marginal benefit of  $l_f$ . This additional term capture the increase in expected marginal utility which stems from the increase in proportion share going to the wife with the homemaking provision as she increases  $l_f$ . Therefore under this non-cooperative framework, the wife will increase her housework and reduce her market work. If the homemaking provision is gender non-neutral such that  $\alpha$  is only a function of  $l_f$  but not  $l_m$ , the first order condition of the husband would not be altered by the homemaking provision.

In practice the law is very likely to be gender non-neutral. For one thing, housework has been predominantly a female task as a result of the long rooted gender specialization of labor within families. Women still do more housework than men in married households (Aguiar & Hurst 2007). In 2009, 18.5 percent of married fathers with children under age 18 that are employed full time with wives also employed full time would do housework whilst 11.6 percent of these fathers would do housework when their wives are not employed. For married mothers, 78.9 percent would do housework when they are not employed and for those that are employed full time, 44.9 percent would still perform housework (Bureau of Labor Statistics 2012). These married fathers are much more likely to participate in the labor market than their wives. The labor force participation rate for men and women with own children under 18 are 93.3 and 70.5 respectively (Bureau of Labor Statistics 2013). It is possible that the husband is the homemaker in some households but on average the law benefits women more, as most homemakers are female.

This model is also consistent with the Work-In-Household (WiHo) theory of Grossbard (2015) (see also Grossbard-Shechtman 1984, 1993), which argues theoretically that an individual pays an implicit or explicit price for any activity that their partners perform that would benefit the individual. Grossbard (2015) calls these activities Work-In-Household Production (WiHo). The homemaking provision would increase the supply of WiHo, as spouses that perform housework are paid more in the form of getting a larger share of assets at divorce. And thus the

higher expected price of WiHo comes from the increase in ex-post divorce property rights of assets accumulated during marriage.

### 3. Empirical Specification: the Individual Fixed Effect Model

By using the time variation of the adoption of the provision across states to identify the causal effects of the homemaking law on spousal behavior, the following individual fixed effect model is used to estimate the impact of the homemaking provision on time allocation of wives:

$$Q_{i,s,t} = \theta_1 uni_{s,t} + \theta_2 sep_{s,t} + \beta_1 pro_{s,t} + \beta_2 pro * uni_{s,t} + \beta_3 pro * sep_{s,t} + \rho eqdist_{s,t} + f_i + \alpha_t + \gamma_s + \mathbf{X}'_{i,s,t} \boldsymbol{\delta} + \epsilon_{i,s,t}$$

Regression (1)

where  $Q_{i,s,t}$  is the outcome variables under investigation including hours of housework and market work hours and the labor force participation of wife  $i$  residing in state  $s$  in year  $t$ ;  $pro$  represents dummies for states that have introduced the homemaking provision;  $uni$  is a dummy variable that takes one if the state is under the unilateral divorce regime at time  $t$  and zero otherwise;  $sep$  is a dummy variable that takes one if the state has separation requirement as grounds for divorce that is less than or equal to two years and zero otherwise;  $eqdist$  denotes dummies for states with equitable property division;  $f$ ,  $\alpha$  and  $\gamma$  represent the individual, year and state fixed effect respectively and the vector  $\mathbf{X}$  stands for a vector of demographic controls that include age and age squared of wife  $i$  and her husbands and dummies for their years of education;  $i$ ,  $s$  and  $t$  denote the individual, state and year subscripts.

Iyavarakul et al. (2011) pointed out that some states might not have unilateral divorce but substantially reduced their separation period requirement as grounds for divorce and this would also make divorce easier. I therefore also examine the interaction effect between the homemaking provision and states with shortened separation requirements to less than 2 years.

Based on the results derived from the theoretical model, if couples behave non-cooperatively regardless of the divorce regimes,  $\beta_1$  is positive on the amount of housework performed by the wife and negative on her market labor and labor force participation. However if the reason that leads to the non-cooperative behavior of spouses comes from the liberalizations of divorce laws,

$\beta_1$  would not be statistically different from zero and  $\beta_2$  and  $\beta_3$  would be positive on time allocated to housework but negative for that to market work.

And if the unitary model holds regardless of divorce regimes, the homemaking provision would have no effect on time allocation of spouses, and so  $\beta_1$ ,  $\beta_2$  and  $\beta_3$  will all be statistically not different from zero.

#### **4. The Data**

##### **A. The Homemaking Provision**

I obtained the information on the timing of implementation of the homemaking provisions from a variety of sources. In some states it is found in their statutes. A number of articles in the law literature such as Batts (1988) provide information on the timing of implementation of the homemaking law for some states. I also traced out established case law and statutes related to the homemaking law from internet search engines for legal cases and codes such as [www.findlaw.com](http://www.findlaw.com) and the case law finder provided by LexisNexis.

##### **B. The Individual Level Data**

The individual fixed effect model which estimates the effect of the homemaking provision on time allocation of the wives employs data from the Panel Study of Income Dynamics (PSID). The PSID contains detailed information on marital events and status, housework and market work hours, labor force participation and education.<sup>7</sup> It also records the state of residence of the sample households, which is crucial to this study. One very desirable feature of the PSID to this study is its long panel dimension which allows us to trace out the behavior of households in the course of marriage and control for individual heterogeneity.

The PSID survey is no longer conducted on an annual basis after 1997. My analysis is based on data up to the 1997 wave. Married women (the spouse of the household head as reported in each survey year) aged between 18 and 55 are included in the sample. I have confined my analysis to wives that are original sample members in the PSID and married prior to the

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<sup>7</sup> The exact questions appear in the questionnaire are: "About how much time does your (Wife/"WIFE") spend on housework in an average week? I mean time spent cooking, cleaning, and doing other work around the house." "About how much time do you (HEAD) spend on housework in an average week? (I mean time spent cooking, cleaning, and doing other work around the houses.)" The answers have been converted into annual hours.

introduction of the homemaking provision as the selection into marriage and match quality could potentially be changed by the homemaking provision.

To better understand the potential value of property settlements, the first three columns of Table 1 are reproduced from Rowe and Morrow (1998). It presents the categories and values assets to be divided of final divorce decrees granted between June 1983 and 1984 in Oregon for couples' marriage over 10 years. I compare the figure of housing to the PSID sample for couples that own houses in 1984. For home value alone, the average value amounts to \$156,278 in 2011 dollars in the PSID sample, which is comparable to the figure in Oregon. Indeed the average value of assets to be divided for propertied couples is not immaterial and therefore it is highly possible that the homemaking provision that alters the property rights of these assets at divorce will alter behavior within marriages, especially for the marriages with a higher probability of divorce.

## **5. Exogeneity of the law**

Following Voena (2012), I exploit the exogeneity of this quasi-natural experiment with respect to the state level household and economic characteristics. It might render the experiment invalid if the introduction of the law is found to be correlated with these state characteristics. The homemaking provision in divorce law across states was based on the recommendation by the Uniform Marriage and Divorce Act (UMDA), as formulated by the National Conference of Commissioners on Uniform State Law (NCCUSL) in 1970, which served as a model for state divorce laws and was a comprehensive effort to codify the family law. This includes recognizing the homemaking UMDA in 1974. I first examine whether there is any correlation between the timing of the adoption of the homemaking provision and the state level household and economic characteristics in 1970. The variables are constructed using the data from PSID and 1% sample of 1970 U.S. Census (Integrated Public Use Microdata Series). The samples are limited to individuals aged 18-50 as this group of marriageable people are the most likely to exhibit impact on the implementation of the law. Figure C.1 a)-d) in Appendix C shows that there is no obvious correlation between the timing of enactment of the homemaking provision and these state variables. Therefore any effects found of the homemaking provision are unlikely to be driven by state demographic trends related to household specialization prior to the introduction of the law.

Table C.1 in Appendix C provides some further exogeneity tests of the quasi-natural experiment. The results from these exogeneity tests suggest that any effects of the homemaking law found in this paper are unlikely to be driven by state demographic trends prior to the introduction of the law. In addition in Table C.1, I add a dummy variable that takes 1 for states that will implement the homemaking provision within 5 years to Regression (1) on the outcome variables examined. None of the leading variables are statistically different from zero.

## **6. The Results**

### **A. The Individual Fixed Effect Estimates: Time Allocation**

Specification (1) in Table 2 suggests that the homemaking provision on average increases amount of time wives spent on housework by 60.5 hours annually. Specifications (2)-(4) introduce interaction terms between the law and the more liberalized divorce regimes to test if the effect of the law is linked with the ease in obtaining divorce. Specification (2) includes the interaction term between the homemaking law and unilateral divorce. It shows that the direct effect of the homemaking provision becomes statistically insignificant after the interaction term is introduced and the homemaking provision increases annual hours of housework performed by wives by 84 hours under unilateral divorce regime. Specification (3) takes away the homemaking provision dummy but adds the interaction term of the homemaking provision and states with two years or less separation requirement for granting divorce. The new interaction term appears to capture part of the effect of the interaction term between the homemaking provision and unilateral divorce. For states with both the homemaking provision and unilateral divorce, wives increase their annual housework by 70 hours and the estimated increase is 74 hours for states with the homemaking law and two year or less separation requirement. The increase amounts to about 4.6 percent of the sample mean. Specification (5) includes both the homemaking provision dummy and its interaction terms with the two divorce laws. The direct effect of the law remains statistically insignificant and the qualitative interpretation of the interaction terms is unaltered.

In terms of the effect of the law on wives' market labor supply on the intensive margin, specification 1 in Table 3 shows that provision alone produces no statistical significant effect on the annual market work of wives. However once the interaction term with the unilateral law is introduced in specification (2), the expected result is found: wives reduce their annual market work by 159 hours under the unilateral divorce regime with the homemaking provision.

Specifications (3) and (4) show that homemaking provision does not produce statistically significant effect in states with shortened separation requirement unlike its effect on annual housework. The effect of the homemaking law on the market work hours supplied by wives residing in unilateral divorce states are largely unaltered by alternative specifications.

On the extensive margin, Table 4 shows that the homemaking provision without any interaction terms with legal regimes does not produce any statistically significant effect on the labor supply of wives. The homemaking law reduces the probability market labor supply of wives who reside in unilateral divorce states by 6-7 percent depending on specifications but the law produces no statistically significant effect on states with separation requirement for divorce that is less than or equal to 2 years.

I also estimated the effect of the homemaking provision on the allocation of time of husbands and found no statistically significant effects overall (not reported).

In sum, the results from the individual fixed effect regressions confirm that the homemaking provision enhances home production performed by wives and the law only produces significant effects under regimes with more liberalized divorce law where divorce can be obtained relatively more easily. The unitary model is not rejected for states with more stringent divorce law as indicated by that overall homemaking provision produces no statistically significant effect without introducing interaction terms between the law with regimes with more liberalized divorce law. The effects of the law are particularly robust for the unilateral divorce states. The homemaking provision however does not seem to affect the labor supply decision of wives in states with shortened separation period as grounds for divorce. Overall the findings from PSID data offer evidence that the liberalization of divorce laws do cause some spouses that are shocked by the policy to behave less cooperatively, and the homemaking provision induces more spousal labor performed by the wives.

## **7. Concluding Remarks**

In the past when divorce was a very rare event the joint decision of spouses in the allocation of time and investment in public goods raised few incentive problems as spouses form a union to maximize the joint-marital surplus through specialization of their labor in home and the marketplace. As such it might be reasonable to assume that the decision process of these

households to generate Pareto efficient outcomes. The realism of this assumption becomes questionable when the commitment to marriage is reduced by the liberalization of divorce laws.

I use a non-cooperative household model to analyze spousal time allocation and investment in public goods. The setting is particularly relevant to societies like the United States where one-half of all new marriages are expected to end in divorce in the wake of the unilateral divorce reform. By no means do my results suggest that all couples act non-cooperatively with unilateral divorce. In line with the model developed in Iyigun (2009), as long as the liberalized divorce laws cause *more* spouses to behave non-cooperatively within marriage, the homemaking law would affect decisions made by these couples.

One major drawback of the model is that it does not highlight the fact that the degree of cooperation in households can be enhanced by the homemaking provision. A more realistic framework might be a hybrid of the cooperative and non-cooperative framework—by allowing for spousal cooperation in the population to depend on marital gain and divorce law. Such integrated framework might better capture spousal behavior in contemporary marriage.

Under unilateral divorce regimes where it is difficult for partners to make commitment to their marriage, the homemaking provision can be viewed as a contract cost reducing device to encourage home production (the performance of “WiHo” activities using Grossbard’s (2015) term). The empirical findings provide support for the non-cooperative household model under liberalized divorce regimes. In particular wives married prior to the introduction of the homemaking provision are found to increase their home production and decrease their labor supply under the unilateral divorce regime. When divorce requires mutual consent or long separation periods, the homemaking provision is much more likely to be irrelevant to intra-household allocation, as spouses can more easily commit to future allocations.



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**Table 1: Values of Assets to be Divided: Types and Dollar Values of Assets of Final Divorce Decrees Granted between June 1983 and June 1984 in Oregon for Marriages over Ten Years**

Asset	% of couples owing	Mean value (1984 dollar)	Mean value (converted to 2011dollar)	Mean value in PSID sample in 1984 (1984 dollar)	Mean value in PSID sample in 1984 2011 dollars
Family home	84.5	71,474.79	160818.3	69,466.9	156,278
Other real property	31.9	127,241.43	286293.2	-	-
Car(s)	99.1	5,578.67	12552.01	-	-
Other vehicles	37.1	5,379.17	12103.13	-	-
Household furnishings	100	8,136.95	18308.14	-	-
Bank account(s)	92.2	5,263.28	11842.38	-	-
Stocks/bonds/investments	31.9	14,422.53	32450.69	-	-
Business/professional practice	29.3	30,109.65	67746.71	-	-
Insurance	41.4	2,320.42	5220.945	-	-
Pension	68.1	13,806.57	31064.78	-	-
Any other asset	28.1	10,917.47	24564.31	-	-
Debts (incl. mortgage debt)	92.2	36,439	81987.75	-	-

Notes: First Three Columns Reproduced from Rowe and Morrow (1988). Last two columns computed with data from the Panel Study of Income Dynamics (1968-1997).

**Table 2: Individual Fixed Effect Estimates of the Effect of the Homemaking Provision on Annual Hours of Housework of Wives**

Independent Variables:	Dependent Variables:			
	Wives'			
	Hours of Housework			
	(1)	(2)	(3)	(4)
Provision	60.51** (30.42)	5.918 (41.55)	-	-41.18 (45.79)
Provision*unilateral divorce	-	84.24* (46.56)	70.72* (36.09)	95.67** (46.12)
Provision*separation	-	-	74.44* (40.79)	91.10** (45.06)
Controls for unilateral, separation requirement ( $\leq 2$ years) and equitable distribution law	X	X	X	X
Individual characteristics	X	X	X	X
State Fixed Effects	X	X	X	X
Year Fixed Effects	X	X	X	X
N	19,579	19,579	19,579	19,579
Individual Fixed Effects	1948	1948	1948	1948

Notes: \*\*\*variable is statistically significant at 1% level; \*\*variable is statistically significant at 5% level; \*variable is statistically significant at 10% level. Robust standard errors are in brackets. Data: Panel Study of Income Dynamics (1968-1997).

**Table 3: Individual Fixed Effect Estimates of the Effect of the Homemaking Provision on Annual Hours of Market Work of Wives**

Independent Variables:	Dependent Variables:			
	Wives'			
	Hours of Market Work			
	(1)	(2)	(3)	(4)
Provision	-36.22 (34.88)	65.92 (48.73)	-	88.92* (53.48)
Provision*unilateral divorce	-	-159.2*** (52.51)	-111.1*** (40.20)	-164.6*** (52.32)
Provision*separation	-	-	-97.39 (47.35)	-45.36 (51.87)
Controls for unilateral, separation requirement ( $\leq 2$ years) and equitable distribution law	X	X	X	X
Individual characteristics	X	X	X	X
State Fixed Effects	X	X	X	X
Year Fixed Effects	X	X	X	X
N	22,559	22,559	22,559	22,559
Individual Fixed Effects	2150	2150	2150	2150

Notes: \*\*\*variable is statistically significant at 1% level; \*\*variable is statistically significant at 5% level; \*variable is statistically significant at 10% level. Robust standard errors are in brackets. Data: Panel Study of Income Dynamics (1968-1997).

**Table 4: Individual Fixed Effect Estimates of the Effect of the Homemaking Provision on Labor Force Participation of Wives**

Independent Variables:	Dependent Variables:			
	Wives' Labor Force Participation			
	(1)	(2)	(3)	(4)
Provision	-0.024 (0.019)	0.018 (0.027)	-	0.020 (0.029)
Provision*uni	-	-0.065** (0.029)	-0.054** (0.022)	-0.066** (0.029)
Provision*separation	-	-	0.003 (0.026)	-0.005 (0.028)
Controls for unilateral, separation requirement ( $\leq 2$ years) and equitable distribution law	X	X	X	X
Individual characteristics	X	X	X	X
State Fixed Effects	X	X	X	X
Year Fixed Effects	X	X	X	X
N	22,559	22,559	22,559	22,559
Individual Fixed Effects	2150	2150	2150	2150

Notes: \*\*\*variable is statistically significant at 1% level; \*\*variable is statistically significant at 5% level; \*variable is statistically significant at 10% level. Robust standard errors are in brackets. Data: Panel Study of Income Dynamics (1968-1997).



## Appendix A: The First Best Benchmark

One primary gain of family formation is that it permits the sharing of public goods and specialization within households. Home production performed by wives is one of the major sources of such gain. There is no problem of underprovision of public goods including housework as the household in principle just operates like a firm that will never dissolve. Optimal cooperation within households can be achieved and spouses would act to maximize households' net gain irrespective of the distribution of the resources produced.

Consider the benchmark in which couples never divorce and they maximize their joint utilities by choosing the time they allocate to housework and market work and the amount they spend on home asset, which is given by:

$$U_m^M + U_f^M = \max_{(g_m, g_f, l_m, l_f, h_m, h_f)} \sum_{i=m, f} v_i(G_1) + 2G_2 \quad (\text{A.1})$$

Subject to the budget constraint:

$$w_i h_i = g_i \quad (\text{A.2})$$

The time constraint for  $i = m, f$  :

$$l_i + h_i = 1 \quad (\text{A.3})$$

The first best amount of time spent on housework and investment in home assets are defined by the following first order conditions:

$$2[\gamma_i f'(l_i)] = w_i \quad (\text{A.4})$$

These are the Samuelson condition for public good provision. (A.4) states that the joint marginal utility from the marginal product of the domestic labor is equal to the market wage of the spouse.

**Proposition 1.** The optimal level of  $l_f$  in this non-cooperative setting must be below the first best level.

$$2[\gamma_i f'(l_i)] = w_i \quad (\text{A.5})$$

**Proof.** When spouses allocate their time non-cooperatively, let the optimal level of  $l_f$

be  $\hat{l}_i$ , the first order condition for  $l_f$  is given by:

$$(1 - \beta)\gamma_f f'(\hat{l}_i) + \frac{(\theta\gamma_i f'(\hat{l}_i)(1 + \beta))}{2} = w_i$$

Simplifying we have:

$$\frac{(2 - 2\beta + \beta\theta + \theta)}{2}\gamma_f f'(\hat{l}_i) = w_i$$

Since  $0 \leq \theta \leq 1$  and  $0 \leq \beta \leq 1$ ,  $\Rightarrow \frac{(2 - 2\beta + \beta\theta + \theta)}{2} < 2$  and  $f$  is concave in  $l_i$ ,  $\therefore \hat{l}_i \leq l_i^*$  ■

## Appendix B: Descriptive Statistics

**Table B.1: Descriptive Statistics of Individual Panel Data (1968-1997)**

Variables	Number of observation	Number of households	Min	Mean	Max	Standard Diviation
Age (wives)	22,559	2,150	18	38.67	55	(9.41)
Age (husbands)	22,559	2,150	18	41.39	81	(10.2)
Years of education (wives)	22,559	2,150	6	12.47	17	(2.23)
Years of education (husbands)	22,559	2,150	6	12.74	17	(2.70)
Annual hours of work (wives)	22,559	2,150	0	927.9	5,840	(885)
Labor force participation (wives)	22,559	2,150	0	0.665	1	(0.472)
Annual hours of housework (wives)	19,579	1,948	0	1,499.2	5,824	(890)
Homemaking provision	22,559	2,150	0	0.414	1	(0.49)
Unilateral divorce law	22,559	2,150	0	0.545	1	(0.50)
Separation requirements ( $\leq 2$ years)	22,559	2,150	0	0.419	1	(0.49)
Equitable distribution	22,559	2,150	0	0.628	1	(0.48)

Note: the means are weighted by PSID individual weights in 1968.

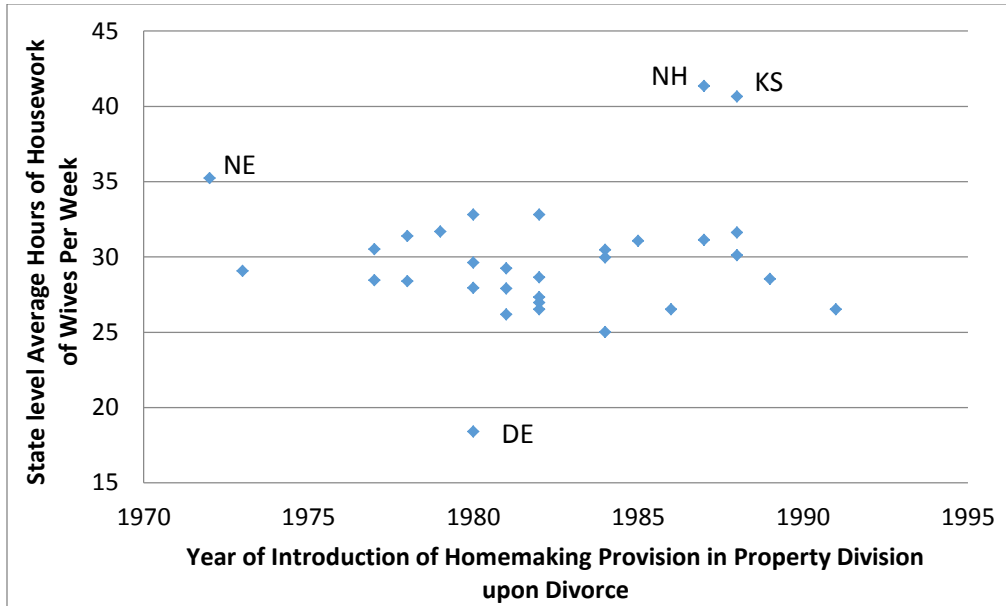
Data: Panel Study of Income Dynamics (1968-1997)

## Appendix C: Exogeneity Tests

### Exogeneity Test 1: Timing of the introduction of homemaking provision and state characteristics in 1970

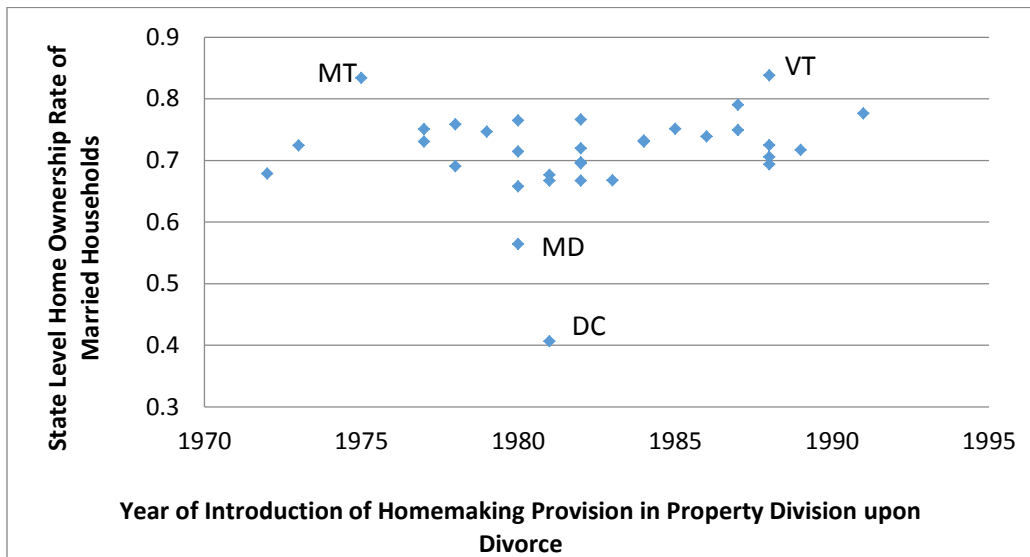
Figure C.1:

a) State level average hours of housework of wives per week



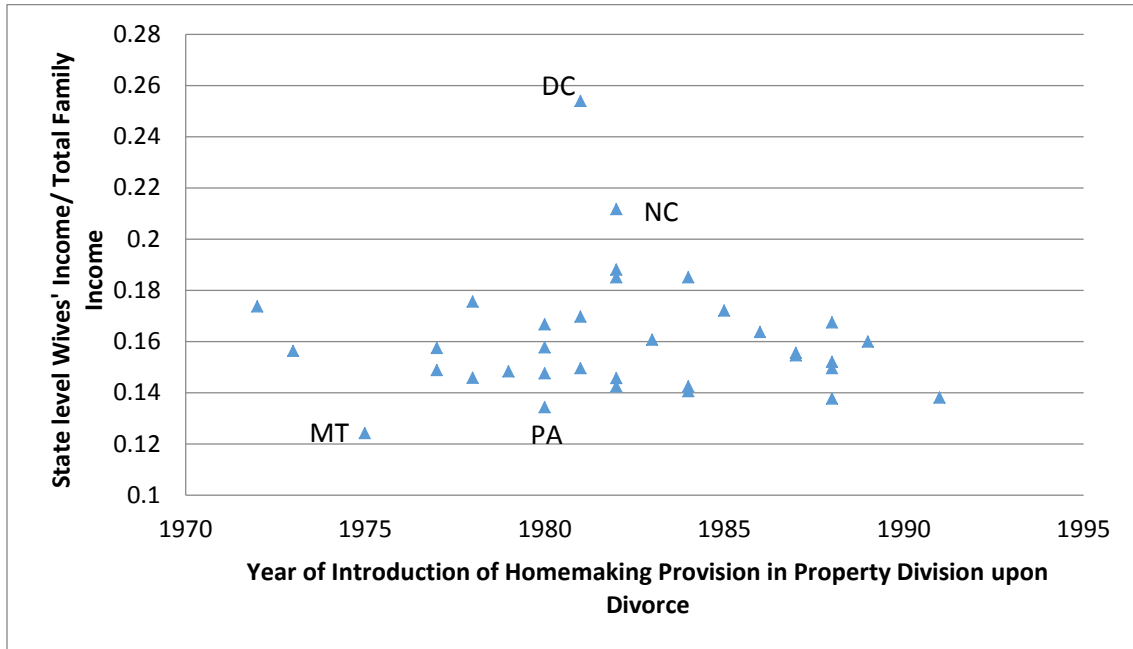
Source: Author's calculation. Data collected from the PSID.

b) State level home ownership rate of married households in 1970



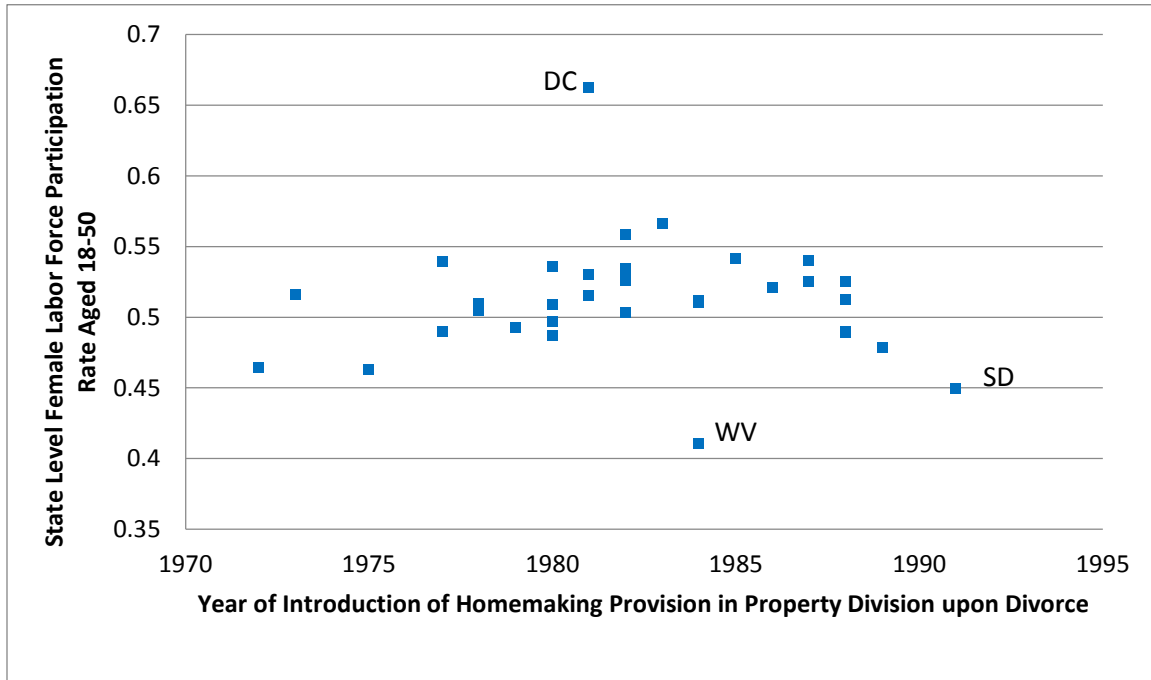
Source: Author's calculation. Data collected from 1% sample of U.S. Census (Integrated Public Use Microdata Series). South Dakota is not identifiable in the data.

**c) State level average share of wives' income in total family income in 1970**



Source: Author's calculation. Data collected from 1% sample of U.S. Census (Integrated Public Use Microdata Series). South Dakota is not identifiable in the data.

**d) State level female labor force participation rate in 1970**



Source: Author's calculation. Data collected from 1% sample of U.S. Census (Integrated Public Use Microdata Series). South Dakota is not identifiable in the data.

## Exogeneity Test 2: Check for Pre-existing Trends

Table C.1 reports the estimated coefficients of a group of dummy variables that indicates 1-5 years prior to states introducing the homemaking provision added to Regression 1. The results show that these leading variables are not statistically distinguishable from zero.

Figure C.2 displays the estimates of the leading variables and their 95% confidence intervals of the following regression using natality data from *Vital Statistics of the United States* from 1976-2009:

$$Q_{st} = \sum_{j=-10(1)}^0 \beta_j \text{pro}_{for\ j\ to\ (j+9)\ years_{s,t}} + \sum_{j=1(5)}^{26+} \beta_j \text{provision}_{for\ j\ to\ (j+4)\ years_{s,t}} + \sum_{k=1(5)}^{26+} \theta_k \text{uni}_{for\ k\ to\ (k+4)\ years_{s,t}} + \kappa \text{compro}_{s,t} + \rho \text{eqdist}_{s,t} + \sigma' \mathbf{x}_{s,t} + \alpha_t + \gamma_s + \epsilon_{s,t}$$

Regression (C.1)

where  $Q_{st}$  is the yearly state birth rate.  $pro$  takes 1 for states that will introduce the homemaking provision in  $-j$  years and  $provision$  is a group of homemaking law dummies that takes one for states having introduced the homemaking law for 1-5 years; 6-10 years up to 26 years and more and zero otherwise;  $uni$  stands for states having implemented unilateral divorce for  $k$  to  $k+4$  years;  $compro$  is a dummy variable that takes one if the state has a community property regime at time  $t$  and zero otherwise;  $eqdist$  is a dummy variable that takes one if the state has an equitable distribution regime for marital properties at time  $t$  and zero otherwise  $\mathbf{x}_{s,t}$  is a vector of state level control variables including the logarithm of state level real disposable income per capita and proportion of population aged 15-54 and proportion of black population ; sex ratio of population aged 15-44 in state  $s$  and year  $t$  ;  $\alpha_t$  and  $\gamma_s$  represent year and state dummies and  $\epsilon_{s,t}$  is an iid error term.

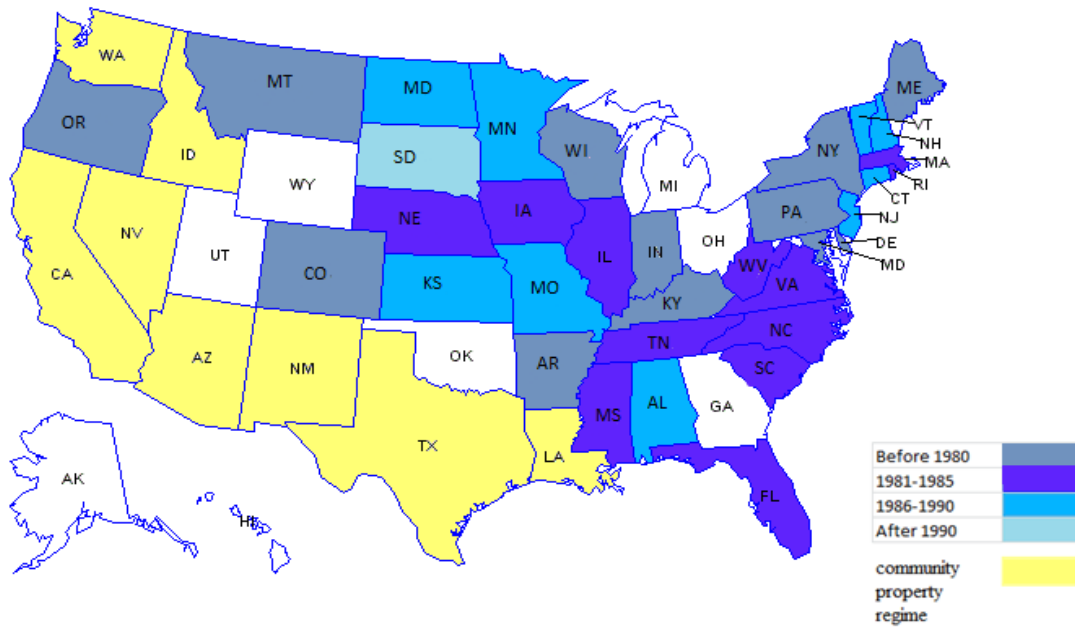
**Table C.1: Estimated Coefficients on Future Policy on Couples Married prior to the Reform**

Independent variable:	Dependent variables (Wives):		
	Annual housework hours	Annual market work hours	Labor force participation
5 Years Prior to Reform	-30.56 (63.31)	-25.83 (66.72)	0.004 (0.037)
4 Years Prior to Reform	-15.15 (62.45)	-35.62 (73.29)	0.005 (0.040)
3 Years Prior to Reform	-25.10 (67.01)	-30.31 (80.87)	0.008 (0.043)
2 Years Prior to Reform	-4.53 (74.02)	-18.02 (86.47)	0.010 (0.046)
1 Years Prior to Reform	-23.46 75.16	-23.52 (92.16)	0.006 (0.048)
N	22,559	19,579	22,559
Individual Fixed Effects	2150	1948	2150

Notes: \*\*\*variable is statistically significant at 1% level; \*\*variable is statistically significant at 5% level; \*variable is statistically significant at 10% level. Robust standard errors are in brackets. Data: Panel Study of Income Dynamics (1968-1997).

## Appendix D.1: Years of Implementations of Divorce Reforms

**Figure D.1: Homemaking Provision in Divorce Law across States: Year of Enactment of the Homemaking Provision Established for Division of Marital Property in Divorce Law <sup>8</sup>**



<sup>8</sup> Wisconsin became a community property regime in 1986.



**Table D.1: Homemaking Provision in Divorce Law across States: Year of Enactment of the Homemaking Provision Established for Division of Marital Property in Divorce Law**

State	Year of Enactment of the Homemaking Provision in Property Division	State	Year of Enactment of the Homemaking Provision in Property Division
Alabama	1989	New York	1980
Alaska	-	North Carolina	1982
Arizona	community property	North Dakota	1989
Arkansas	1978	Ohio	-
California	community property	Oklahoma	-
Colorado	1973	Oregon	1977
Connecticut	1988	Pennsylvania	1980
Delaware	1980	Rhode Island	1983
District of Columbia	1981	South Carolina	1982
Florida	1985	South Dakota	1991
Georgia	-	Tennessee	1984
Hawaii	-	Texas	community property
Idaho	community property	Utah	-
Illinois	1981	Vermont	1988
Indiana	1978	Virginia	1981
Iowa	1982	Washington	community property
Kansas	1988	West Virginia	1984
Kentucky	1972	Wisconsin	1977 <sup>9</sup>
Louisiana	community property	Wyoming	-
Maine	1979		
Maryland	1980		
Massachusetts	1982		
Michigan	-		
Minnesota	1987		
Mississippi	1982		
Missouri	1986		
Montana	1975		
Nebraska	1984		
Nevada	community property		
New Hampshire	1987		
New Jersey	1988		
New Mexico	community property		

Source: Wong (2016)

<sup>9</sup>Wisconsin became a community property regime in 1986.