

Social norms, partnerships and children

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Abstract This paper presents a social norms interpretation to explain cross-country differences in partnership formation rates. Social norms are modeled as a constraint on the allocation of household labor that diminishes the gains of entering a partnership, especially for highly educated women with a higher opportunity cost of time. Results using individual level data from 7 waves of the European Community Household Panel (1995–2001) confirm the predictions from the theory. These results are robust to controlling for country varying factors such as childcare policies and divorce rates, and are mostly driven by marriage (as opposed to cohabitation) decisions. Given that household formation is a necessary prerequisite to having children, our results potentially shed light onto the process of below replacement fertility and the economic challenges associated with it.

Keywords Marriage market · Gender roles · Household labor

JEL classifications D13 · J0 · J1 · J2 · Z13

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1 Introduction

During the past decade, below replacement fertility in most developed countries has drawn the attention of researchers in a variety of social science disciplines. Countries such as Spain, Italy, and Japan are the leading examples with average total fertility rates of 1.2. Below replacement fertility presents new economic challenges for a society, as it changes the age structure of the population and may require structural adaptations with important implications for welfare (e.g., Weil 1999) and the pay-as-you-go pension systems (e.g., Rindfuss et al. 2003). In European countries, there is a positive relationship between the proportion of individuals currently living in a partnership and the average number of children per woman (e.g., Sevilla-Sanz 2010). However, despite the positive correlation, the study of below-replacement fertility has traditionally overlooked household formation processes. Given that having a child prior to a partnership is fairly infrequent in many countries, even in countries with high levels of non-marital unions (e.g., Kiernan 2000), it is important to study the household formation decisions in order to understand below-replacement fertility processes.

This paper presents a simple partnership formation model to illustrate how social norms on the division of household labor may influence a woman's decision to form a household. Social norms are modeled as a constraint on how potential partners divide the household surplus generated through household production once the partnership has been formed.¹ The model has two predictions. First, social norms regarding the gender division of labor diminish a woman's gains from entering a household. Thus, a woman living in a country with more traditional social norms has, *ceteris paribus*, a lower probability of forming a partnership. Second, women with the highest opportunity cost of time are more constrained by a traditional gender division of labor, so that the negative effect of social norms on a woman's probability of entering a partnership is higher for highly educated women.

Our focus is motivated by time-use studies showing that a substantial amount of non-market work is devoted to home production (e.g., Hersch and Stratton 2002) and the growing evidence that fathers are increasingly involved in childcare (e.g., Goldscheider and Kaufman 1996). In fact, a comparison of high-fertility with low-fertility industrialized countries indicates that men's involvement in household tasks is considerably higher in high-fertility countries. For example, weekly hours devoted to housework by men in Japan is 3.5 versus 13.8 h by men in the United States (e.g., Juster and Stafford 1991). Similarly, more recent time use studies in Europe reveal that Spanish women devote one more hour to domestic work per day than Swedish women and that only 70 percent of Spanish and Italian men versus 92 percent of Swedish men ever engage in household activities (e.g., Eurostat 2006).

¹ It is beyond the scope of this paper to look at how social norms are formed and maintained over time. Some authors have argued that the inability of potential partners to credibly commit, before the household is formed, to make transfers of time rather than transfers of private consumption, constrain potential partners to rely on gender roles when making a decision on how to divide the household surplus. At the root of this argument is the non-observability by third parties of spouse's time devoted to household production, and the absence of credible threats for certain household production activities (especially those related to caring activities) (e.g. Folbre and Bittman 2004).

Incorporating social norms into an economic model of household formation contributes to the recent literature that looks at how social norms (or culture) shape an individual's economic behavior, such as savings decisions (e.g., Carroll and Rhee 1994), fertility and female labor force participation (e.g., Fernandez et al. 2006), and living arrangements (e.g., Giuliano 2007). Social norms are to a large extent enforced through non-market interactions and thus difficult to isolate empirically. This literature attempts to identify the effect of social norms by looking at the behavior of immigrants in the United States and finds that, in most cases, immigrants replicate the behavior of the individuals in their country of origin. This replica of behavior in a neutral environment with the same institutions, policies, and macroeconomic conditions, suggests that social norms in the country of origin play a role in determining an individual's economic behavior.²

In the absence of experimental data, this paper provides two different identification strategies of the effect of social norms on an individual's household formation probability. The first identification strategy comes from the time and cross-country variation of the data. In a similar fashion to a difference in difference approach, where the treatment is a continuous rather than a discrete variable (i.e., the degree of social norms in a given country), we are able to identify the effect of social norms net of other country-specific and time-varying factors. A second identification strategy relies on the panel structure of the data, which allows for the identification of the effect of social norms net of (permanent) individual heterogeneity in preferences (e.g., Manski 2000).

The empirical analysis uses 7 waves and 13 countries from the European Community Household Panel data (1995–2001 ECHP). The ECHP data is a cross-country dataset containing individual (and household) level information on demographic and economic variables. For each country and year we construct the average of the female to male ratio of childcare time as a measure of social norms regarding the household division of labor. The empirical findings support the predictions of the model. Results suggest that more traditional social norms regarding the household division of labor negatively affect a woman's probability of forming a partnership, particularly for highly educated women. These results hold after controlling for the time and country variations in the data, as well as for permanent individual heterogeneity and other aggregate variables. We also find that whereas more traditional social norms hinder the formation of formal marriages, they encourage entering into more flexible forms of cohabitation.

The paper is organized as follows. Section 2 presents a stylized model of partnership formation. Section 3 describes our empirical strategy. Section 4 describes the ECHP data and presents basic summary statistics and Section 5 presents the results. Section 6 presents some robustness checks and Section 7 concludes.

² Related to this literature is also the study of social or group effects. In the case of household formation models, Loughram (2002) analyzes the effect of male wage inequality on female's marriage probabilities and Drewianka (2003) exploits variations in a two-sided mate matching market to identify the externalities associated with spousal search.

2 A model of partnership formation and social norms

This section presents a stylized equilibrium model of partnership formation that focuses on how the allocation of household labor by potential partners may influence a woman's probability of entering a partnership. Although a partial equilibrium analysis may seem unsatisfactory from a theoretical perspective, it does not invalidate the empirical results, which can be understood as the general equilibrium outcome of changes in social norms and union formation probabilities.

We focus on two specific aspects of the gains of forming a partnership: efficiency gains from specialization in household production, and the consumption of market public goods.³ Individual utilities once a partnership (union) has been formed V_i^u are given by the sum of the utilities obtained from the consumption of a market public good c^u and a household produced public good z^u , and the disutility from the time spent in the production of the household public good $f(h_i^u)$. The composite consumption good includes market consumption goods that are jointly consumed by the household c^u (such as groceries, housing, childcare, etc.) and that can be acquired in the market at a normalized price $p = 1$. Similar to Becker's original marriage market model, a woman's decision to form a household takes place when her individual utility within a partnership V_i^u is equal to or greater than her utility if single V_i^s .

The household produced good z^u can be understood without loss of generality as a lower bound for the amount of household production that needs to be done in the household. These are the "commodities" in a Beckerian sense, such as a clean house or home-made meals (see Becker 1975). The household produced good z^u is consumed jointly by both partners but differs from c^u in that it cannot be purchased in the market. Instead, it is produced using both partners' time in household production such that $z^u = h_m^u + h_f^u$, for $0 \leq h_i^u \leq 1$ and $i = m, f$.⁴ Each partner derives disutility $f(h_i^u)$ from the time devoted to household production h_i^u , where $f(\cdot)$ is an increasing and convex cost function. We can write an individual's utility within the household as $V_i^u = U(z^u) - f(h_i^u) + c^u$, for $i = m, f$. We can write each partner's time devoted to household production h_i^u as a fraction of the produced output such that $h_m^u = (1 - \alpha)z^u$ and $h_f^u = \alpha z^u$ for $0 \leq \alpha \leq 1$, where α is the share of total household labor done by the woman.

Social norms regarding the division of household labor are modeled as a lower bound \underline{h}_f^u that constrain a woman's housework time to be greater than or equal to the value dictated by the existing gender roles in the country she lives in, so that $h_f^u \geq \underline{h}_f^u$. More traditional social norms regarding the household division of labor are captured in the model by a higher \underline{h}_f^u . In other words, the constraint (if binding)

³ Other dimensions of forming a partnership such as risk pooling or consumption smoothing are left out of the analysis for exposition purposes.

⁴ The assumption of perfect substitutability between partners' time in household labor is made for expositional purposes only. The results are robust to more general specifications of the production function, which may include market goods as inputs in the production of the household-produced public good, as well as other forms of substitutability between partners' time.

effectively prevents potential partners perfectly contracting for the desired division of household labor once the partnership is formed.

The predictions of the model are twofold. First, a straightforward application of the envelope theorem implies that household utility is decreasing in h_f^u . It is thus easy to show that a woman's individual utility within the partnership is decreasing in h_f^u as well. Thus, a woman living in a country with more traditional social norms regarding the household division of labor extracts a lower utility from a partnership and has a lower probability of forming a partnership, everything else being constant, than another woman living in a country with a less traditional division of household labor. This prediction may explain the current cross-country differences in partnership rates, arising from the different social norms regarding the household division of labor across countries.

The second prediction of the model is that, given the social constraint imposed by social norms, the utility loss when a partnership is formed is lower, the higher the female wage. That is, those women with the highest opportunity cost have the most to lose when constrained to a traditional division of labor within the household, and are the ones less likely to enter a partnership.⁵ To the extent that female education has increased over the years, and that Southern European countries have more traditional social norms, this prediction may partly explain the dramatic decrease in partnership formation rates in Southern Europe.

The model specification, where the only private goods are the disutility from time devoted to household production, implies that it is not possible to compensate a woman for having a socially constrained partner. There is vast evidence however of positive assortative mating along the education spectrum, with higher educated women marrying higher educated men, and lower educated women marrying lower educated men (Oppenheimer 1988, Mare 1991, Pencavel 1998, Lewis and Oppenheimer 2000, Blossfeld and Timm 2003). It is thus possible that there are transfers made from the higher earner partner to compensate the lower earner partner. Thus, higher educated women might (as the household optimum) choose to spend more time at household production compared to low educated women married to low educated men, given the high level of income provided by their husbands.⁶ The theory becomes then inconclusive as to what is the sign of the effect of more egalitarian social norms, and it becomes an empirical question to see which effect dominates.

⁵ It is easy to show that the constraint is more likely to be binding, the higher the female wage, i.e., there is a wage w_f^u such that if $w_f \geq w_f^u$ the constraint becomes binding. Also, given a binding constraint h_f^u , it is easy to see that the utility a woman gets within the household is lower, the higher the woman's wage. See Gimenez-Nadal et al. (2007) for a detailed description of the household maximization problem.

⁶ There is a recent debate in the literature as to whether higher educated women are pulling out of the labor force in the US. This stylized fact, known as the "opt-out revolution", was first sensationalized by Lisa Belkin in a 2003 New York Times article, and many other media report followed (e.g., Wallis 2004, Story 2005, Trunk 2005). However, recent studies have found no evidence that highly-educated women are opting out of employment (e.g., Goldin 2006, Vere 2007, Cohany and Sok 2007, Boushey 2008, Percheski 2008).

3 Empirical strategy

In order to explain the current cross-country differences in partnership formation rates, related to the different social norms across countries, we begin by estimating a baseline linear probability model of a woman's probability of forming a household as a function of observable individual characteristics and a country's social norms regarding the household division of labor.⁷ The main prediction of the model is that more traditional social norms regarding the household division of labor have a negative effect on a woman's partnership formation probability, especially for highly educated women. We therefore interact the *Traditionality Index* with a woman's education level to capture the differential effects of social norms by education attainment. Our baseline specification is:

$$p(y = 1|x)_{i,t,k} = \alpha + \beta_1 X_{i,t,k} + \beta_2 TI_{t,k} + \beta_3 TI_{t,k} * Secondary_{i,t,k} + \beta_4 TI_{t,k} * University_{i,t,k} + \varepsilon_{i,t,k} \quad (1)$$

The dependent variable in Eq. (1) is the probability that a woman has ever been in a partnership and takes value '1' if a woman has ever formed a household, and zero otherwise. $X_{i,t,k}$ is a vector of individual observable characteristics (secondary education, university education, age, and cohort of birth). Social norms regarding the household division of labor in year t and country k are captured by the *Traditionality Index* $TI_{t,k}$, where higher values of $TI_{t,k}$ represent more traditional social norms regarding the household division of labor. $TI_{t,k} * Secondary_{i,t,k}$ and $TI_{t,k} * University_{i,t,k}$ represent interactions between the *Traditionality Index* and whether the respondent has secondary or university education, respectively. The error term captures, among other things, the unobserved tendency to form a household and is assumed to follow a normal distribution with variance σ_k , which is independently distributed across countries but correlated within countries $k = 1, \dots, 13$.⁸ The coefficients of interest are β_2 , β_3 and β_4 . A negative β_2 means that more traditional social norms regarding the household division of labor are correlated with a lower probability of forming a household, which would explain why countries that have on average a more traditional division of labor, may also have lower partnership formation rates.⁹ If the way we have modeled social norms is correct, we would expect the coefficient on the interaction β_3 and β_4 to be negative.

⁷ The fact that the data allows the use of individual fixed effects makes the linear probability model particularly attractive with respect to other models such as the conditional logit model. Although the linear probability model may not provide a very good estimate of the partial effects at extreme values of the independent variables, it still produces a consistent and even unbiased estimator of the partial effects on the response probability averaged across the distribution of the independent variable.

⁸ See Moulton (1990) for the need to consider correlated disturbances when estimating the effects of aggregate variables on micro units.

⁹ Choosing a relatively large cell size i.e., the respondent's country, minimizes measurement error in the estimates of partnership-market specific social norms. Given that mobility across countries is relatively small, choosing a large cell size also avoids the self-selection problem that is present in most group studies.

One of the potential identification problems of the effect of social norms on a woman's partnership formation probability is that any permanent difference across countries over the sample period, or any changes over time, may lead to a biased coefficient on social norms if these changes are correlated with a woman's partnership formation probability, as well as with social norms regarding the household division of labor. In the absence of experimental data, this paper provides two different identification strategies of the effect of social norms on an individual's household formation probability. The first identification strategy comes from the time and cross-country variations of the data. In a similar approach to a difference in difference approach, where the treatment is a continuous rather than a discrete variable (i.e., the degree of social norms in a given country), we are able to identify the effect of social norms net of other time and country fixed effects. Equation (2) estimates the same specification as in Eq. (1) controlling for country and year fixed effects, where I_t and I_k are the year and country dummies, respectively.

$$p(y = 1|x)_{i,t,k} = \alpha + \beta_1 X_{i,t,k} + \beta_2 TI_{t,k} + \beta_3 TI_{t,k} * Secondary_{i,t,k} + \beta_4 TI_{t,k} * University_{i,t,k} + \beta_5 I_t + \beta_6 I_k + \varepsilon_{i,t,k} \quad (2)$$

A second identification strategy relies on the panel structure of the data, which allows for the identification of the effect of social norms net of (permanent) individual heterogeneity in preferences (e.g., Manski 2000). This is particularly important in this context, since there is a reason to believe that social norms and individual preferences regarding the household division of labor may be positively correlated. If this is the case, the *Traditionality Index* coefficient would be capturing the effect of individual preferences regarding the household division of labor on a woman's partnership formation probability, rather than the effect of social norms as a constraint, which is the way that it has been characterized here. Unfortunately, the ECHP does not contain information on individual preferences regarding the household division of labor.¹⁰ Thus, although using individual fixed effects allows us to control for individual permanent unobserved heterogeneity that may be correlated to social norms, limitations in the data do not allow us to control for varying individual heterogeneity that changes over time and that may be correlated to social norms regarding the household allocation of labor. We thus estimate Eq. (3) with individual fixed effects.¹¹

$$p(y = 1|x)_{i,t,k} = \alpha_i + \beta_1 X_{i,t,k} + \beta_2 TI_{t,k} + \beta_3 TI_{t,k} * Secondary_{i,t,k} + \beta_4 TI_{t,k} * University_{i,t,k} + \varepsilon_{i,t,k} \quad (3)$$

¹⁰ Hamermesh (2004) offers an interesting discussion of what economists can learn from the use of subjective outcomes as inputs, to explain economic behavior. See Sevilla-Sanz (2010) for an example of how to use individual reported attitudes to isolate the effect of social norms on an individual's partnership formation probability.

¹¹ One could argue that individual's preferences are to some extent the result of social norms. In this case, the *Traditionality Index* coefficient reported in the fixed effects specification would be a lower bound of the total effect of social norms.

4 The European Community Household Panel data

The data comes from the European Community Household Panel (ECHP). This survey is a standardized multi-purpose annual panel data survey covering the years 1994–2001, over 15 countries.¹² The cross-country nature of the data, its panel structure, and the wealth of information collected in the ECHP make it a perfect candidate for cross-country comparisons within Europe. Particularly important for our analysis is the information regarding the allocation of time to childcare within the household.

4.1 Sample and summary statistics

We use a sample of women between 30 and 45 years of age from 7 of the 8 available waves of the ECHP. We restrict the sample within this age range because we are interested in the fertility implications of partnership decisions. We drop observations for 1994, as this year does not contain information on the household allocation of childcare time. We also exclude from the main analysis observations from Sweden (which is not a panel dataset) and Luxembourg (because of the small sample size). Thus, we restrict the analysis to women living in the following countries: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Portugal, Spain, The Netherlands and The United Kingdom.

We construct a *Traditionality Index* for each year and country. To construct the index we use couples where at least one partner devotes some positive time to childcare over the reference week, where childcare is given by the question in the ECHP: “Roughly how many hours per week do you spend looking after children?”. The *Traditionality Index* $TI_{t,k}$ is constructed by calculating for each couple the ratio between the difference of the time the woman in the couple devotes to childcare activities minus the time the man devotes to childcare activities, over the total time devoted to childcare activities by the couple. We then sum these ratios over all the couples in our sample, for a given year and country, and multiply the sum by 100. The *Traditionality Index* has the following formulation:

$$TI_{t,k} = 100 \sum_i \frac{hw_{i,t,k} - hm_{i,t,k}}{hw_{i,t,k} + hm_{i,t,k}} \quad (4)$$

where $hm_{i,t,k}$ denotes the weekly hours devoted to childcare by the man, and $hw_{i,t,k}$ denotes the weekly hours devoted to childcare by the woman, in partnership i , year t and country k . We obtain one value per each year and country, and each value of the *Traditionality Index* is used for all women in the selected age range, independently of whether they have children or not.¹³

The ECHP does not contain any information about housework, and we need to assume that social norms regarding the household division of housework are well

¹² See Peracchi (2002) for a detailed description of the ECHP.

¹³ We have repeated the analysis with alternative specifications of the index: $TI_{t,k} = \sum_i (hm_{i,t,k} - hw_{i,t,k})$, $TI_{t,k} = \sum_i (hw_{i,t,k} - hm_{i,t,k})$, $TI_{t,k} = \sum_i \frac{hw_{i,t,k} - hm_{i,t,k}}{hm_{i,t,k}}$ and $TI_{t,k} = \sum_i \frac{hw_{i,t,k}}{hw_{i,t,k} + hm_{i,t,k}}$. Our main conclusion follows. Results are available upon request.

captured by the division of childcare time for our identification strategy to work. Krueger (2007) shows that whereas playing with children is the activity with the highest enjoyment score (jointly with listening to music), respondents report much lower degrees of satisfaction while engaging in basic childcare activities such as feeding, changing diapers, and providing children with medical care. Basic childcare ranks thus among the least enjoyable activities together with housework and commuting. Because stylized questions of the sort asked by the ECHP (either childcare or housework) are more likely to precisely capture the less enjoyable routine-type of childcare (e.g., Kitterød and Lyngstad 2005, Kan 2008), we are more confident that the sort of childcare activities that are being captured by the ECHP survey is similar in nature to housework.¹⁴

Female education has generally been used in the literature as a measure of market human capital and thus as potential female outside opportunity to marriage. We define a dummy for each of the three levels of education in the ECHP.¹⁵ The dependent variable is whether a woman has ever been in a partnership (Column (5) in Table 1). A woman is considered to have been in a partnership if she is either currently married or has ever been married, or if the respondent is currently living with a partner in a cohabiting union.

Column (1) in Table 1 shows the average value of the *Traditionality Index* in each country for the relevant sample. Higher values of the index indicate more traditional social norms regarding the household division of labor. Countries are ranked from less to more traditional, with a higher value of the index meaning that, on average, individuals in that particular country hold a more traditional division of labor. Among the most egalitarian countries are Denmark and the Netherlands, whereas Spain and Italy are among the countries with a more traditional division of labor. Columns (2), (3), and (4) in Table 1 show the proportion of women who have low, medium and high education levels respectively. These summary statistics show important cross-country differences in female educational attainment. The countries with highest proportion of low educated women in the sample are Portugal (78.62) and Spain (60.18) while the lowest proportion of low educated women correspond to Finland (15.89) and Germany (16.89). The highest proportion of high educated women correspond to Finland (46.82) and Denmark (46.57) while the lowest rates correspond to Portugal (9.38) and Austria (9.20).

The cross-country relationship between the *Traditionality Index* and each of the female education levels is 0.18 for the low educated, 0.06 for the medium educated,

¹⁴ The methodological literature (e.g., Juster and Stafford 1991) shows that diary estimates of time spent in activities from time-use surveys are more accurate than responses to questionnaire items used by most household surveys (such as the ECHP), which face retrospective recall problems. Using the Multinational Time Use Study, a collection of diary surveys for several developed countries, we also find that the share of time devoted to “Basic Childcare” (such as breastfeeding, changing nappies, feeding a child, rocking a child to sleep) has a positive correlation (0.57 overall for all countries) with the share of time spent on housework.

¹⁵ These dummies are constructed using information about the highest level of general or higher education completed. The answers to these questions take three values that we code as high education level [*Recognized third level education* (ISCED 5–7)], medium education level [*Second stage of secondary level education* (ISCED 3)], and low education level [*Less than second stage of secondary education* (ISCED 0–2)].

Table 1 Summary statistics

	Traditionality index	Primary education	Secondary education	University education	Partnership rate	Age
Denmark	29.50 (0.07)	20.70 (1.51)	32.73 (1.69)	46.57 (1.83)	93.05 (0.99)	37.45 (0.17)
Finland	41.34 (0.08)	15.89 (1.27)	37.28 (1.65)	46.82 (1.69)	89.06 (1.30)	37.60 (0.16)
The Netherlands	51.55 (0.03)	22.39 (1.15)	58.73 (1.32)	18.87 (1.02)	91.80 (0.76)	37.08 (0.13)
The United Kingdom	15.78 (0.31)	54.33 (1.63)	13.13 (1.09)	32.54 (1.53)	88.58 (1.11)	37.01 (0.16)
Germany	26.65 (0.42)	16.89 (1.18)	61.32 (1.70)	21.79 (1.48)	89.67 (1.45)	37.40 (0.17)
Belgium	59.74 (0.02)	27.93 (1.62)	31.15 (1.60)	33.83 (1.60)	92.63 (0.92)	37.14 (0.17)
France	61.97 (0.03)	31.92 (1.08)	41.10 (1.15)	24.79 (1.01)	89.36 (0.73)	37.51 (0.11)
Austria	64.77 (0.13)	28.62 (1.66)	62.17 (1.74)	9.20 (0.95)	90.36 (1.04)	36.80 (0.17)
Italy	65.70 (0.02)	49.38 (1.15)	39.71 (1.12)	9.90 (0.69)	89.37 (0.72)	37.16 (0.11)
Ireland	69.26 (0.12)	42.71 (1.64)	42.45 (1.61)	14.46 (1.22)	86.53 (1.30)	37.32 (0.15)
Spain	73.60 (0.01)	60.18 (1.18)	18.28 (0.94)	21.55 (1.00)	88.57 (0.80)	37.16 (0.11)
Portugal	78.22 (0.04)	78.62 (1.54)	11.87 (1.21)	9.38 (1.14)	91.15 (0.94)	37.08 (0.17)
Greece	79.03 (0.02)	45.13 (1.34)	28.66 (1.26)	26.05 (1.24)	92.97 (0.69)	37.40 (0.13)
European Countries	64.19 (0.04)	40.80 (0.35)	36.40 (0.34)	22.07 (0.29)	90.05 (0.21)	37.24 (0.03)

Standard deviations in parenthesis

Countries are ordered from less to more traditional social norms regarding the household division of labor according to our *Traditionality Index*

Sample consists of women between 30 and 45 years old from the ECHP (1995–2001)

and -0.15 for the high education level. These results show that controlling for education level in our analysis is important, as more egalitarian countries such as Denmark and Finland also seem to have a lower proportion of low educated women than do other less egalitarian countries such as Spain or Italy. The cross-country relationship between the *Traditionality Index* and partnership rates is negative (with a value of -0.0036). More egalitarian countries such as Denmark and the Netherlands also seem to have a higher proportion of women in partnerships than do other less egalitarian countries, such as Spain or Italy.

Although informative, it is difficult to make any causal inferences on the relationship between social norms toward the household division of labor and household formation probabilities from these raw cross-country averages. Section 5

takes into account country, year, and individual heterogeneity to shed some light on the effect of these variables on a woman’s household formation probability.

5 Household division of labor and a woman’s partnership formation probability

Table 2 shows the results of estimating Eqs. (1)–(3) on the probability of having ever been in a partnership. The prediction of the model is strongly confirmed. Column (1) shows the results from estimating our baseline specification as in

Table 2 Social norms and partnership decisions

	(1)	(2)	(3)	(4)	(5)
Traditionality index	-4.33*** (1.18)	-5.32*** (1.20)	9.70*** (3.32)	2.14 (3.65)	0.37 (0.81)
Traditionality index *sec. educ	0.06 (1.57)	0.13 (1.57)	1.11 (1.61)	1.38 (1.62)	0.46 (0.53)
Traditionality index *univ.educ	-10.14*** (1.46)	-9.95*** (1.46)	-9.83*** (1.49)	-9.57*** (1.49)	-2.12*** (0.69)
Age	7.11*** (0.54)	7.30*** (0.54)	7.15*** (0.53)	7.32*** (0.53)	1.74*** (0.20)
Age squared	-8.33*** (0.70)	-8.33*** (0.69)	-8.37*** (0.69)	-8.37*** (0.69)	-1.97*** (0.25)
Secondary education	-1.45 (1.00)	-1.68* (1.00)	-1.98* (1.02)	-2.23** (1.02)	-0.03 (0.34)
University education	-0.17 (0.86)	-0.40 (0.86)	-0.92 (0.88)	-1.10 (0.88)	1.42*** (0.44)
Constant	-64.69*** (10.02)	-69.97*** (10.09)	-71.51*** (10.14)	-73.44*** (10.16)	52.74*** (3.96)
Cohort dummies	Yes	Yes	Yes	Yes	No
Country dummies	No	No	Yes	Yes	No
Year dummies	No	Yes	No	Yes	No
R sq.	0.04	0.04	0.04	0.04	0.032
N	118,493	118,493	118,493	118,493	118,493

Robust standard errors in parenthesis

In Column (1) we estimate a linear probability model of the following equation: $p(y = 1|x)_{i,t,k} = \alpha + \beta_1 X_{i,t,k} + \beta_2 TI_{i,t,k} + \beta_3 TI_{i,t,k} * Secondary_{i,t,k} + \beta_4 TI_{i,t,k} * University_{i,t,k} + \varepsilon_{i,t,k}$, which controls for personal observed characteristics (age, education, cohort of birth), the *Traditionality Index*, and the interaction of the *Traditionality Index* with secondary and university education. Column (2) adds year dummies (Ref.: 2001) to the estimation in Column (1). Column (3) adds country dummies (Ref.: Finland) to the estimation in Column (1). Column (4) adds year and country dummies to the estimation in Column (1). Column (5) estimates the same equation as in Column (1) using fixed effects to control for permanent unobserved heterogeneity

*** Significant at the 1% level; ** Significant at the 5% level; * Significant at the 10% level

Eq. (1). There is a negative relationship between the probability of having ever been in a partnership and our *Traditionality Index*, and this relationship is stronger for highly educated women. Column (2) adds controls for time fixed effects to the baseline specification in Eq. (1). The *Traditionality Index* becomes more negative, suggesting a decreasing trend in the probability of forming a partnership, especially amongst less traditional countries. This may be possible if for instance, a shift in public policy that made entering a household less attractive over the period was positively correlated with less egalitarian social norms, leading to a more negative coefficient on the *Traditionality Index* coefficient. Hence, the *Traditionality Index* coefficient may have been partly capturing the negative effect of the policy rather than the effect of social norms. Column (3) shows results of estimates including country fixed effects to our baseline specification in Eq. (1) to account for permanent differences across countries between years. Country fixed effects are included to avoid potential biases that could arise if there exist country-level factors that are correlated with social norms. When introducing country fixed effects, the *Traditionality Index* becomes positive and statistically significant at the 99 percent level. This result suggests that there may be other factors at the country level whose effect was being picked up by the *Traditionality Index* coefficient. For example, if more traditional countries also have public family policies that promote the formation of households, then omitting country fixed effects would lead to a less negative coefficient on the *Traditionality Index* coefficient, as it would be partly capturing the positive effect of these policies.

In Column (4) we observe that once we control for country and year fixed effects at the same time, as in Eq. (2), the *Traditionality Index* loses significance (although still remains positive), suggesting that country and time effects cancel each other. Column (5) shows results from estimating our preferred specification controlling for individual unobserved heterogeneity as in Eq. (3). Once permanent unobserved heterogeneity is controlled for, other personal and country-varying factors turn out to be less important in the explanation of partnership decisions, and the *Traditionality Index* coefficient drops in magnitude and significance. In all specifications the interaction between the *Traditionality Index* and having a university degree is statistically significant at the 99 percent level, with a negative sign. Thus, these results suggest that women with a college degree are the ones more affected by traditional social norms regarding the gender distribution of household labor.

Based on our preferred specification in Column (5), an increase of 100 in the *Traditionality Index* is associated with a 2.12 percentage points lower probability of forming a household for women with high education level. Thus, a woman living in Denmark, with the lowest *Traditionality Index* of 29.50, has a probability 1.05 percentage points higher of entering a partnership, than a woman living in Greece, with the highest *Traditionality Index* of 79.03. The coefficients of the *Traditionality Index* and its interaction with secondary level of education is not statistically significant at the 95% level, which means that differences across countries in the gender distribution of household labor (i.e., different gender roles) mainly affect college educated women.

The coefficients on the rest of the variables are as expected. The relationship between age and the probability of having ever been in a partnership is an inverted U-shape, and one additional year of age increases the probability to have ever been in a partnership by 1.74 percentage points, with a peak at 44 years of age, when the probability of having ever been in a partnership begins to decrease with each year of age. The level of education is negatively associated with the probability of having ever been in a partnership in most specifications, although the coefficient on highly education becomes statistically significant and positive in the fixed effects specification (Column (5)). These results suggest that part of the observed association between level of education and the probability of having ever been in a partnership comes from individual unobserved heterogeneity, and highlights the need to account for these unobserved factors. The positive gradient between education and partnership formation probability is consistent with other studies on education and marriage/partnership formation probability (e.g., Goldscheider and Waite 1986; Goldscheider and Waite 1991; Qian and Preston 1993; Thornton et al. 1995; Clarkberg 1999; Goldstein and Kenney 2001; Sweeney 2002).

We have done some additional estimations to check the consistency of our results. We have used time trend rather than year dummies as regressors, looked at older women between 30 and 50 (as opposed to women between 30 and 45 years old as in the main analysis), used a *Traditionality Index* constructed using a random sample of couples, introduced self-reported health and labor status as controls, and included predicted wages. Main results still follow and we continue to find a statistically significant negative association between the probability to form a household and our *Traditionality Index* for women with a university degree. Results are available upon request.

6 Robustness checks

6.1 Country varying factors

The estimates presented in Table 2 yield an unbiased estimate of the social norms coefficients β_2 , β_3 and β_4 so long as the country fixed effects do not vary over the survey period and the year fixed effect does not vary across countries. There may be, however, changing factors at the country level that are correlated with both an individual's probability of entering a household, and a country's social norms toward the household division of labor. These country-year effects are thus not controlled for by either the year or the country fixed effects, and omitting them may bias the *Traditionality Index* coefficients β_2 , β_3 and β_4 . Among these country-specific variables are family policies, and labor market and marriage market conditions. Introducing these country-year variables in the analysis may allow us to differentiate whether the *Traditionality Index* coefficient captures the effect of social norms toward the division of household labor on an individual's household formation probability, or whether this coefficient is simply capturing the effect of these country-specific variables.

Table 3 Summary statistics, country varying factors

	Sex ratio	Female Activity rate	Crude Divorce rates	% Public Exp. Paternity leave	% Public Exp. Day care centers
Denmark	102.47	84.31	2.53	1.08	3.15
Finland	105.13	84.61	2.67	1.34	2.00
The Netherlands	102.20	73.31	2.19	0.00	1.22
The United Kingdom	105.49	75.94	2.77	0.18	0.98
Germany	105.22	76.24	2.26	0.62	0.73
Belgium	104.54	74.01	2.84	0.32	0.65
France	105.83	79.16	1.99	0.72	1.75
Austria	107.08	77.31	2.34	0.88	0.72
Italy	106.39	59.13	0.61	0.24	0.70
Ireland	101.33	62.66	0.27	0.15	0.37
Spain	107.40	78.40	1.53	0.23	0.38
Portugal	104.21	62.42	0.88	0.27	0.61
Greece	101.96	62.16	0.91	0.18	0.31
Corr. with <i>Traditionality Index</i>	0.15	-0.52	-0.60	-0.36	-0.54

Sex Ratio is defined as the number of women per 100 men (Eurostat 2010); Female Activity Rate is obtained from Eurostat (2010); Crude Divorce Rates are defined as the number of divorces occurring among the population of a given geographical area during a given year, per 1,000 mid-year total population of the given geographical area during the same year (Eurostat 2010); Percentage of Public Expenditure Spent on Paternity Leave is measured as the percentage of public expenditure spent as cash benefits in kind out of the Total General Government Expenditure (OECD 2010); Percentage of Public Expenditure Spent on Day Care Centers is measured as the percentage of public expenditure spent as benefits in kind out of the Total General Government Expenditure (OECD 2010)

Countries are ordered from less to more traditional social norms regarding the household division of labor

As is common in the marriage market literature, we control for the Sex Ratio in each country and year, defined as the number of women per 100 men, to capture any effect of the conditions of the household market on an individual's household formation probability.¹⁶ The underlying idea is that if the Sex Ratio is lower, women are more highly valued in the marriage market and they do not need to compensate their partners for their undesired characteristics, so that they do not need to devote so much time to *Work-In-Marriage* (e.g., Grossbard-Sechtman 1984). As a result, the Sex Ratio would have a negative correlation with a woman's probability of forming a household. To the extent that the Sex Ratio in a country is correlated with social norms regarding the household division of labor, we expect the *Traditionality Index* coefficient to be biased and the direction of this bias will depend on the sign of this correlation. Column (1) in Table 3 shows the Sex Ratio (Eurostat 2010), which varies from 101.33 in Ireland to 107.40 in Portugal, and has

¹⁶ Grossbard and Amuedo-Dorantes (2007) analyze the effect of sex ratios on married women's labor force participation. In their model, more favorable sex ratios for women increase the gains from marriage and thus make it less likely for any woman to participate in the labor force.

a positive correlation with the *Traditionality Index* of 0.1481, meaning that more egalitarian countries have a lower Sex Ratio than less egalitarian countries.

We also include Female Activity rates (Eurostat 2010). This variable should control for female labor market and public support conditions that may affect the costs and benefits a woman faces when forming a household. For example, there is some evidence that welfare benefits have a positive effect on the prevalence of single motherhood and thus a negative effect on a woman's probability of forming a household (e.g., Gonzalez 2007). As before, to the extent that this variable is correlated with social norms regarding the household division of labor, we expect the *Traditionality Index* coefficient to be biased. Column (2) in Table 3 shows Female Activity rates, which varies from 84.61 in Finland to 59.13 in Italy. The correlation between the *Traditionality Index* and Female Activity rates is -0.5207 , which indicates that countries with less traditional social norms regarding the household division of labor also have a higher Female Activity Rates.

Divorce rates are very different across European countries (e.g., Kalmijm 2007, Gonzalez and Viitanen 2009), and more traditional countries have generally lower divorce rates. Column (3) in Table 3 shows Crude Divorce rates (CDR) in the analyzed countries (Eurostat (2010)), defined as the number of divorces occurring among the population of a given geographical area during a given year, per 1,000 mid-year total population of the given geographical area during the same year. Compared with more traditional countries such as Greece, Italy and Spain (with CDR of 0.91, 0.61, and 1.53 respectively), less traditional countries such as Denmark, Finland and the Netherlands have higher CDR (e.g., 2.53, 2.67, and 2.19 respectively). Differences across countries in divorce rates might cause a bias in the *Traditionality Index* coefficient, although the sign of the bias is however undetermined a priori. On the one hand, such differences may implicitly capture the cost of dissolving a formal marriage, and thus affect the relative risk of entering into a particular form of partnership, such that in countries where divorce is more widely accepted there is either a lower social stigma attached to divorce or more favorable laws regarding divorce, reflecting lower household dissolution costs, which we may expect to increase an individual's household formation probability. This would imply our *Traditionality Index* coefficient to be more negative (upward bias in absolute value) as the *Traditionality Index* would be capturing the effects of both gender roles (with negative effect) and differences in divorce rates (with positive effect since divorce would be less costly in less traditional countries). On the other hand, it could be that gains of forming a household in those countries where divorce is more widely accepted are lower in the first place (if the gains of a household are expected to last for a shorter period), and thus we may expect to see a negative sign in the divorce coefficient, implying our *Traditionality Index* coefficient to be less negative (downward bias in absolute value).

Different childcare arrangements across countries may also foster an unequal division of labor in countries where provision is low and the higher earning member (typically the male) is exempt from caring for children during work hours. For example, Southern European countries are characterized by a very poor provision of public childcare whereas in Northern European countries enjoy almost universal public childcare from year one (e.g., Randall 2000, del Boca and Wetzels 2007, Boeri

and van Ours 2008). Conscious that the reason for such differences in public childcare provision may also be a matter of preferences for equality, we additionally control for differences in childcare arrangements across countries by including two variables in the regressions: the percentage of public expenditure spent on parental leave policies, and the percentage of public expenditure spent on day care centers (e.g., del Boca and Wetzels 2007, Boeri and van Ours 2008). This way we provide some reassuring evidence that our index is capturing social norms rather than capturing different public childcare provisions across countries.¹⁷ Column (4) in Table 3 shows the percentage spent on parental leave policies (OECD (2010)), which varies from none in The Netherlands to 1.34% in Finland, and has a negative correlation with the *Traditionality Index* of -0.36 , with more egalitarian countries having a higher percentage of their public expenditure spent on parental leave policies. Column (5) in Table 3 shows the percentage spent on day care centers (OECD (2010)), which varies from 0.31 in Greece to 3.15 in Denmark, and has a negative correlation with the *Traditionality Index* of -0.54 , with more egalitarian countries having a higher percentage of their public expenditure spent on day care centers. These last two negative correlations indicate that countries with less traditional social norms regarding the household division of labor also have a higher percentage of public expenditure spent on parental leave policies and day care centers.

To explore the potential bias in the *Traditionality Index* coefficient arising from the omission of these country-year variables, Columns (2) to (6) in Table 4 present the results from estimating Eq. (3) by first introducing these variables one by one, and then all together in Column (7). Results are compared to those in Column (1), which presents the results from estimating the effect of the *Traditionality Index* using our preferred specification (Eq. 3) as presented in Column (5) of Table 2. The coefficient on a country's Sex Ratio is negative, although non-statistically significant at the 95% level. The coefficient on Female Activity rate is negative and statistically significant at the 95% level, suggesting that women living in countries where Female Activity rate is high have a lower probability of forming a household. However, the size of this coefficient is too small to be considered economically relevant. We find a negative association between CDR and partnership formation probabilities, but such associations are not statistically significant at the 95 percent level. Finally, the coefficient on the percentage spent on paternity leave policies is negative although non-statistically significant at the 95% level, while the coefficient on the percentage spent on daycare centers is negative and statistically significant at the 95% level.

All in all, including these variables as controls does not seem to change the size or significance of the *Traditionality Index* coefficient, which remains at values very similar to the baseline specification presented in Column (1) of Table 4. For completeness, Column (7) in Table 4 presents the results from estimating Eq. (3) controlling for all the country-level variables. As expected from the previous results, the *Traditionality Index* coefficient remains unchanged.

¹⁷ The percentage of public expenditure spent on day care centers is defined as the percentage spent on “day-care/home-help services” programmes as in-kind benefits, and the percentage of public expenditure spent on paternity leave policies is defined as the percentage spent on “maternity and parental leave” programs as cash benefits.

Table 4 Social norms and partnership decisions, country varying factors

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Traditionality index	0.37 (0.81)	0.38 (0.84)	0.82 (0.86)	0.35 (0.81)	0.69 (0.87)	0.60 (0.82)	1.03 (0.90)
Traditionality index *sec. educ	0.46 (0.53)	0.46 (0.53)	0.53 (0.53)	0.46 (0.53)	0.49 (0.53)	0.46 (0.53)	0.52 (0.53)
Traditionality index *univ. educ	-2.12*** (0.69)	-2.12*** (0.69)	-2.10*** (0.69)	-2.11*** (0.69)	-2.14*** (0.69)	-2.19*** (0.69)	-2.20*** (0.69)
Age	1.74*** (0.20)	1.74*** (0.20)	1.79*** (0.21)	1.74*** (0.20)	1.74*** (0.20)	1.78*** (0.20)	1.87*** (0.21)
Age squared	-1.97*** (0.25)	-1.97*** (0.25)	-1.95*** (0.25)	-1.97*** (0.25)	-1.96*** (0.25)	-1.96*** (0.25)	-1.95*** (0.25)
Secondary education	-0.03 (0.34)	-0.03 (0.34)	-0.10 (0.34)	-0.02 (0.34)	-0.06 (0.34)	-0.07 (0.34)	-0.13 (0.34)
University education	1.42*** (0.44)	1.41*** (0.44)	1.36*** (0.44)	1.42*** (0.44)	1.43*** (0.44)	1.45*** (0.44)	1.43*** (0.44)
Sex ratio	-	-0.02 (0.28)	-	-	-	-	0.46 (0.33)
Female activity rate	-	-	-0.08** (0.03)	-	-	-	-0.08** (0.03)
Crude divorce rates	-	-	-	-0.25 (0.24)	-	-	-0.33** (0.13)
% Public exp. paternity leave	-	-	-	-	-0.96 (0.60)	-	-0.56 (0.67)
% Public exp. daycare centers	-	-	-	-	-	-0.28** (0.12)	-0.27 (0.25)
Constant	52.74** (3.96)	54.52* (29.50)	55.59*** (3.91)	52.91*** (3.95)	52.88*** (3.94)	51.31*** (4.05)	5.95 (34.48)
Cohort dummies	No						
Country dummies	No						
Year dummies	No						
R sq.	0.01	0.01	0.01	0.01	0.01	0.01	0.01
N	118,493	118,493	118,493	118,493	118,493	118,493	118,493

Robust standard errors in parenthesis

Sample consists of women between 30 and 45 years old from the ECHP (1995–2001)

The dependent variable takes value “1” if a woman has ever formed a household, and “0” otherwise

We estimate the following equation: $p(y = 1|x)_{i,t,k} = \alpha_i + \beta_1 X_{i,t,k} + \beta_2 TI_{t,k} + \beta_3 TI_{t,k} * Secondary_{i,t,k} + \beta_4 TI_{t,k} * University_{i,t,k} + \varepsilon_{i,t,k}$. In all specifications we include age (and age squared) of women, and birth cohort, in order to control for the fact that as women become older, they may become less attractive for their male counterparts and less economically dependent on their male counterparts, which may influence the decisions of women to enter into a partnership

*** Significant at the 1% level; ** Significant at the 5% level; * Significant at the 10% level

6.2 Marriage versus cohabitation

Although our dependent variable does not distinguish between marriage and cohabitation decisions, there is a large literature on the difference between the two union types, including differences on duration and dissolution rates (e.g., Thornton 1988, Bumpass and Sweet 1989), labor force participation (e.g., Spanier 1983), income (e.g., Rindfuss and van den Heuvel 1990), pooling of financial resources (e.g., Winkler 1997, Heimdal 2003), and time devoted to housework (e.g., South and Spitze 1994) and childcare (e.g., Kalenkoski et al. 2005, Hoffert 2006). There are large differences between rates of cohabitation and formal marriages rates across developed countries (e.g., Kiernan 1999, Kiernan 2000), which may reflect the different commitment and break-up costs associated to the different types of unions across countries. For example, Sweden is characterized as a cultural-institutional setting that tends to treat marriage and cohabitation as similar unions (e.g., Bradley 1996). However, in the case of Italy, the lack of a diffusion of cohabitation is mainly due to the strong ties between parents and children, anthropologically rooted in the Italian society (e.g., Rosina and Fabroni 2004).

Table 5 shows the analysis separately for marriage decisions and cohabitation decisions for our preferred specification (as in Eq. 3). We find that the *Traditionality*

Table 5 Marriage versus cohabiting

	(1) Marriage	(2) Cohabiting
Traditionality index	-1.89** (0.94)	2.94** (1.41)
Traditionality index *sec. educ	0.20 (0.65)	1.93** (0.97)
Traditionality index *univ. educ	-1.08 (0.75)	-0.40 (1.14)
Secondary education	-0.20 (0.43)	-1.08* (0.64)
University education	0.55 (0.50)	0.66 (0.74)
R sq.	0.019	0.003
N	118493	118493

Robust standard errors in parenthesis

Sample consists of women between 30 and 45 years old from the ECHP (1995–2001)

The reported coefficients come from estimating a linear probability model on the probability of ever having ever been married (Column (1)) or being currently cohabiting (Column (2))

We estimate the following equation: $p(y = 1|x)_{i,t,k} = \alpha_i + \beta_1 X_{i,t,k} + \beta_2 TI_{i,t,k} + \beta_3 TI_{i,t,k} * Secondary_{i,t,k} + \beta_4 TI_{i,t,k} * University_{i,t,k} + \varepsilon_{i,t,k}$. In all specifications we include age (and age squared) of women, and birth cohort, in order to control for the fact that as women become older, they may become less attractive for their male counterparts and less economically dependent on their male counterparts, which may influence the decisions of women to enter into a partnership

*** Significant at the 1% level; ** Significant at the 5% level; * Significant at the 10% level

Index, although smaller in magnitude, is negative and statistically significant at the 95 percent level in the case of marriage decisions (see Column (1) in Table 5). In contrast, the *Traditionality Index* is positive and statistically significant at the 95 percent level in the case of cohabitation.¹⁸ These results suggest that the effect of more rigid gender roles on the probability to form a household is mainly being driven by marital, rather than cohabitation unions. Thus, whereas more traditional societies hinder more rigid contracts such as contractual marriages, they foster more flexible arrangements such as cohabiting unions. The interaction of the *Traditionality Index* with the college dummy is still negative (more so for the case of marriage), but it is less precisely estimated. A possible interpretation of these results is that, as mentioned in Sect. 5, the positive assortative mating in the marriage market by education results in higher educated women who opt into marriage to optimally choose to spend more time on household production given the high level of income provided by their partners (especially if they are formally married as opposed to cohabiting).

7 Conclusion

This paper complements conventional economic analysis and presents a social norms interpretation to explain cross-country differences in partnership formation rates. Social norms are modeled as a constraint on the allocation of household labor, which may diminish the gains to enter a partnership. Thus, a woman living in a country with a more traditional division of household labor has, *ceteris paribus*, a lower probability of forming a partnership. Furthermore, the social constraint is more likely to bind for highly educated women.

The empirical findings support the predictions of the model. After controlling for permanent individual heterogeneity and other aggregate variables at the country level, the results suggest that more traditional social norms regarding the household division of labor negatively affect a woman's probability of forming a partnership and that the effect social norms have is especially negative for highly educated women. We also find that whereas more traditional societies hinder more rigid contracts such as contractual marriages, they foster more flexible arrangements such as cohabiting unions.

It is beyond the scope of this paper to look at how social norms are formed and maintained over time. Understanding these processes, however, could provide the theoretical and empirical foundations for designing work and family policies (for example, policies geared toward solving imperfect commitment mechanisms within the household, that may constrain the allocation of household time to what is prescribed by social norms). We leave this issue for further research.

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¹⁸ Same results follow if we take a sample of older women between 30 and 50.

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