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ORIGINAL PAPER

# Household division of labor and cross-country differences in household formation rates

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**Abstract** This paper considers the extent to which the gender division of labor affects the likelihood of household formation. Using repeated cross sectional data covering highly-developed nations, we consider the differential effects of aggregate social norms regarding the division of household labor. Controlling for other factors that affect the marriage market, our findings indicate that more egalitarian norms are associated with an increase in the probability of forming a household. When additionally controlling for individual attitudes, we find that, ceteris paribus, more egalitarian women are less likely to form a household, while more egalitarian men are more likely to do so. This pattern of results is consistent with economic models of the marriage market where partners contract over the future household division of labor. Moreover, given the salience of household formation as a proximate determinant of fertility, our results potentially shed light onto the process of below replacement fertility and the economic challenges associated with it.

**Keywords** Household formation · Social norms · Division of labor

**JEL Classification** D13 · J0 · Z13

## 1 Introduction

Low fertility levels across OECD countries have led to a rapid aging of the population resulting in shrinkage of the workforce. These population trends

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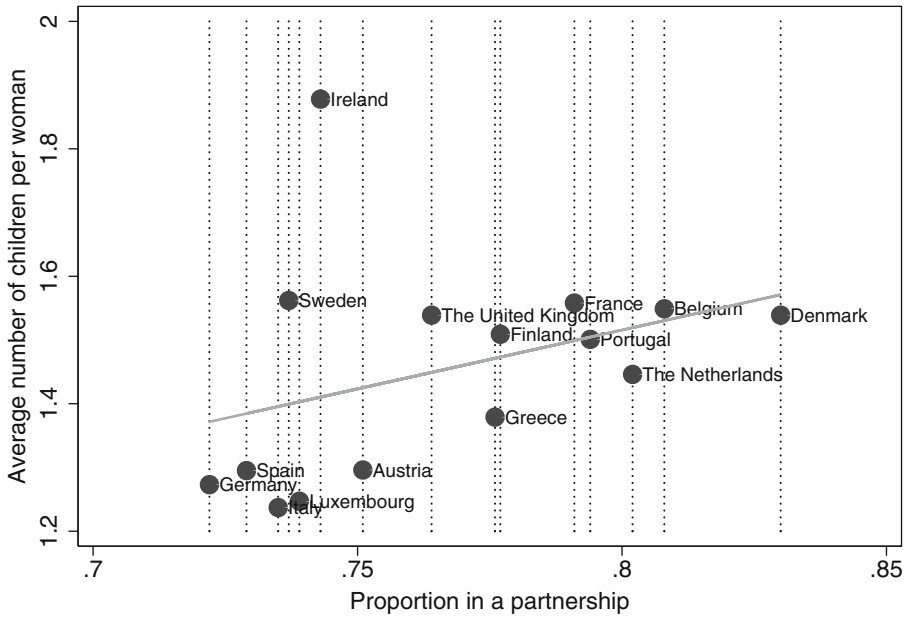
may jeopardize economic growth in the absence of offsetting changes in employment rates and productivity, and may require structural adaptations with important implications for public pensions, health expenditures, and welfare (e.g., Weil 1999). In European countries, there is a positive relationship between the proportion of individuals currently living in a partnership and the average number of children per woman (see Fig. 1).[1] 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 (see Kiernan 2004), it is important to study the household formation decisions in order to understand below-replacement fertility processes.

The marriage literature has traditionally focused on female market human capital to explain differences in household formation rates. It is argued that the level captures market human capital as well as the household production productivity, reflecting the opportunity costs faced by individuals when deciding whether to enter or not enter a household. This paper proposes an additional explanation based on social norms regarding the household division of labor. One of the most important gains of forming a household are the gains associated to the sharing of household public goods and services. Most of these goods and services, the so-called "commodities" in a *Beckerian* sense (such as a clean house, a home-made meal, or children), are produced within the home (see Becker 1975). We argue that social norms may shape an individual's decision to enter a household by altering the incentives to contribute to the household public goods, and thus by changing the gains to forming a household.[2]

There are two opposite ways in which social norms may operate in the marriage market. One way is by changing women's trade-offs between the home and the market. For example, women living in more egalitarian societies may be discouraged from accumulating household-specific human capital, and reduced discrimination in the labor market in more egalitarian societies may lead to women spending less time in home labor. Lower domestic work will arguably lead to a lower provision of household public goods upon forming a partnership, resulting in diminished gains to forming a household in these

[1]The sample is individuals between 30 and 40 years old that are taken from the 1994 to 2001 waves of the European Household Community Panel data set. The proportion of individuals in a partnership is calculated as the proportion of individuals who answer yes to either cohabiting or being married. The average number of children per woman is calculated as the number of children under 18 living with a woman aged 30 to 40 years old at the moment of the interview, regardless of whether the woman is in a partnership or not. Because Southern Europeans leave the parental home later, this measure is probably overestimating fertility and underestimating partnership formation in these countries, making the positive correlation between fertility and partnership formation even stronger. Using a different age for the main sample does not significantly change results.

[2]Although of genuine interest, it is beyond the scope of this paper to explain how social norms arise and how they are maintained (for a useful discussion see Young 1993).




Source: Author's calculations from the European Community Household Panel Data

**Fig. 1** Fertility and household formation rates in Europe

countries. Alternatively, more egalitarian social norms may lower the penalty faced by men for engaging in traditionally female domestic activities. For example, a man will be more likely to take up paternity leave if more men are taking it, if it is a normal male activity, and consequently he is not ostracized for it (see Akerlof and Kranton 2000). A higher share in home labor by men in more egalitarian societies will result in a higher production of household public goods upon forming a household, increasing the gains from forming a partnership and leading to higher household formation rates in these countries.[3]

Using the 1994 and 2000 International Social Survey Program (ISSP) we estimate an individual's household formation probability as a function of individual characteristics and country-specific social norms to uncover which of the two competing effects dominates empirically. The fact that social norms are to a large extent enforced through non-market interactions makes them difficult to isolate empirically. A growing line of work looks at immigrants in the United States to identify the effect of social norms on individual's behavior (e.g., Fernández et al. 2006; Giuliano 2007). Despite facing the same

[3]In principle nothing stops women in more egalitarian countries from compensating by contributing less. It is reasonable to assume that this is a second order effect and that it will not result in a significant decrease in the provision of household goods. Using labor economics parlance, we are using the commonly made assumption that the scale effect dominates the substitution effect.

institutions as US natives, immigrants in the US have been found to generally behave as they would in their country of origin, which suggests that social norms (or culture) in the country of origin must play a role in determining an individual's economic behavior. Related to the above literature is also the study of social or group effects. In the case of household formation models, Loughran (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.

In our empirical analysis we exploit the cross-country and time variation in social norms, and control for other marriage and labor market characteristics, as well as family policies, which might otherwise bias the estimated effect of social norms. We further extend the analysis to include an individual's reported attitudes regarding the gender division of labor as a way to inform us whether social norms matter beyond individual preferences. Our main finding is that individuals living in more egalitarian countries have, everything else equal, a higher probability of forming a household. This result is consistent with the hypothesis that more egalitarian social norms decrease a man's cost of providing home labor, resulting in higher gains to forming a household. We also find that, holding social norms constant, a man with more egalitarian attitudes has a higher probability of entering a household, whereas a woman with more egalitarian attitudes has a lower probability of forming a household.

The differential effect of individual attitudes by gender is consistent with the marriage market literature where potential partners contract over the future household division of labor (e.g., Grossbard-Sechtman 1984). Household produced goods and services use both partners' time as inputs, which is costly in terms of required effort. For example, everybody enjoys *a clean* house, but not necessarily *cleaning* the house. Most forms of home labor are traditionally associated with femininity roles. Thus, holding social norms constant, a woman with more egalitarian attitudes will be less willing to devote time to these kind of tasks, whereas a more egalitarian man will be happy to engage in domestic activities. The implication is that a more egalitarian man will always be chosen over a less egalitarian man, because he contributes a higher share to the home produced public good allowing his potential partner to enjoy the same level of household public goods while devoting less time and effort herself. Conversely, a woman with less egalitarian attitudes will always be chosen over a more egalitarian woman. Ultimately, the fact that the effect of social norms and individual preferences run in opposite direction for women further supports the notion of social effects.

The literature on social norms and the household division of labor has long been present in economics and sociology. For example, Akerlof and Kranton (2000) present a model of economic identity to explain the empirical observation that when a wife works more hours outside the home, she still undertakes a larger share of home production. In their model, a husband loses identity when his wife earns more than he does because of the belief held by most men that *men should earn more than their wives*. Equality in utility is

restored when the wife undertakes more housework than her husband, given the conviction that *men should not do women's work at home*. This argument is similar to the *doing gender* hypothesis brought forward by the sociological literature to explain the same empirical regularity in a variety of countries [see Bittman et al. (2001) for the Australian case and Brines (1994) for the U.S among others]. With some exceptions (e.g., Lundberg and Pollak 1993) this literature has focused on the effect of the gender division of labor once the household has been formed. Here we extend this line of research by analyzing how the household division of labor may affect the decision to enter a household in the first place.

The paper is organized as follows. Section 2 discusses the empirical specification used in the analysis. Section 3 describes the ISSP data in detail, and Section 4 shows the main results. Section 5 conducts some relevant robustness checks and Section 6 concludes.

## 2 Econometric specification

We estimate a baseline binary response model (probit) of an individual's probability of forming a household as a function of observable individual characteristics and a country's social norms. Although a dynamic model would be more realistic, limitations in the data make it only possible to estimate a static model like the one presented here. It is assumed throughout the paper that it is country- specific norms that affect the ability of potential partners to efficiently divide the household surplus. Given that mobility across countries is relatively small, choosing a large cell size such as a respondent's country avoids the self-selection problem that is present in most group studies. The observed dependent variable $y_{i,t,k}$ is binary and takes value one if the individual has ever formed a household, and zero otherwise. If $y^*_{i,t,k}$ represents the unobservable propensity of forming a household for individual $i$ at time $t$ and country $k$, we can write:

$$y^*_{i,t,k} = X_{i,t,k}\beta_1 + E_{t,k}\beta_2 + I_t\beta_3 + I_k\beta_{k,4} + \varepsilon_{i,k} \tag{1}$$

where $y_{i,t,k} = 1$ if $y^*_{i,t,k} > 0$, and 0 otherwise. $X_{i,t,k}$ is a vector of individual observable characteristics (education, age, and sex). Social norms in year $t$ and country $k$ are captured by $E_{t,k}$. Higher values of $E_{t,k}$ represent more egalitarian social norms. $I_t$ and $I_k$ are the year and country dummies respectively. The error term captures the unobserved taste for forming a household and is assumed to follow a normal distribution with variance $\sigma^2_k$, which is independently distributed across countries but correlated within countries $k = 1...13$ (see Moulton 1990). The coefficient of interest is $\beta_2$. A positive (negative) $\beta_2$ means that more egalitarian social norms are associated with a higher (lower) probability of forming a household.

Year fixed effects $I_t$ are included to account for permanent differences across countries between surveys. For example, a shift in public policy in all countries that made entering a household less attractive over the period,

and that was positively correlated with more egalitarian social norms, would lead to a downward bias in the social norms coefficient. That is, the social norms coefficient $\beta_2$ would be partly capturing the negative effect of the policy rather than the effect of social norms, and thus this coefficient would be biased downwards. Similarly, country fixed effects $I_k$ are included to avoid potential biases that could arise if there exist country-level factors that are correlated with social norms. For example, if more egalitarian countries also have public policies that increase the costs of forming a household, then omitting country fixed effects would lead to a downward bias in the social norms coefficient, as it would be partly capturing the negative effect of these policies.

The above approach yields a consistent estimate of the social norms coefficient $\beta_2$ 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 might be, however, changing factors at the country level that capture the costs (or gains) associated with entering a household for individuals living in different countries. These country specific variables are likely to be correlated with an individual's probability of entering a household as well as with a country's social norms, and omitting them might bias the estimate $\beta_2$. Among these country-specific variables are country-specific labor and marriage market characteristics, family policies, or even other social norms like social norms toward the formation of households *per se*. Introducing these country-year variables in the analysis may allow us to differentiate whether the $\beta_2$ coefficient captures the effect of social norms or whether this coefficient is just capturing the effect of other country-specific costs associated with forming a household.

In order to take these changing country-level variables into account, we estimate the following equation:

$$y^*_{i,t,k} = X_{i,t,k}\beta_1 + E_{t,k}\beta_2 + I_t\beta_3 + I_k\beta_{k,4} + + Z_{t,k}\beta_5 + \varepsilon_{i,k} \tag{2}$$

where $Z_{t,k}$ are country-year variables other than a country's social norms. This approach is similar 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). In particular we control for marriage market characteristics such as the ratio of men to women, labor market characteristics such as the female unemployment rate, and the proportion of individuals in a country with positive views toward marriage, cohabitation, and divorce. These three variables might also reflect the gains of forming a household either by capturing social norms regarding the household formation *per se*, or by capturing country-specific policies toward the formation of households.

### 2.1 Social norms vs. individual attitudes

Because country-specific social norms are likely to be correlated with individual attitudes, a potential identification problem may arise if the reported *individual* attitudes are associated with an individual's probability of forming a household. In this case, the social norms coefficient $\beta_2$ in Eq. (2) would be

capturing the effect of individual preferences rather than the effect of social norms. In order to take individual attitudes into account we estimate Eq. (3):

$$y^*_{i,t,k} = X_{i,t,k}\beta_1 + E_{t,k}\beta_2 + Z_{t,k}\beta_3 + I_t\beta_4 + I_k\beta_{k,5} + A_{i,t,k}\beta_6 + \varepsilon_{i,k} \qquad (3)$$

where all the variables are defined as before and $A_{i,t,k}$ represents an individual's reported attitudes.

As mentioned in the Introduction we should expect the individual attitudes coefficient to be different depending on the sex of the respondent. Household produced goods and services use each partner's time as inputs, which is costly in terms of required effort. For example, everybody enjoys *a clean* house or a non-crying baby, but not necessarily *cleaning* the house or changing nappies. We should then expect that on the one hand, a man with more egalitarian attitudes experiences a lower penalty for any given time that he devotes to the production of household public goods. Thus, for any established household division of labor the gains from entering a household will be greater, and he will be more willing to form a household. In this case $\beta_6$ would be negative. On the other hand, a woman with more egalitarian attitudes experiences a higher penalty for any given time that she devotes to home labor. Thus, for any established household division of labor she will be less likely to form a household and we should see a positive $\beta_6$. As a result, living in a country with more egalitarian social norms and being more egalitarian both increase a man's probability of forming a household. However, whereas a woman living in a more egalitarian country has a higher probability of forming a household, a woman who holds more egalitarian attitudes has a lower probability of forming a household.

## 3 The 1994 & 2002 International Social Survey Program: family and changing social norms module

The data used in the empirical analysis come from a pooled cross-section of the 1994 and 2002 International Social Survey Program [ISSP (1994, 2002)]. The ISSP is an annual program of cross-national collaboration on surveys between several social science institutes dating back to 1983. Each member state individually carries a module of a 15-minute self-completion supplement to their regular national surveys, and includes a common core of background variables. The number of member states is currently 39, although not all members have participated since 1983. The ISSP data offer a unique opportunity for cross-country analysis in topics such as social inequality, social networks, and the role of government, as they coordinate national social science surveys to produce a common set of questions asked in identical form in the participating nations. An example of the use of the ISSP data in labor economics can be found in Albrecht et al. (2000).

In each of the participating countries, an individual of at least 16 or 18 years of age (depending on the country) from the selected households is administered a virtually identical questionnaire. Each year a topical module

on a specific subject is developed and put together with the standard questionnaire. In the years 1994 and 2002 the ISSP topical module was "Family and changing social norms" and in addition to the usual demographic and economic variables, the survey also collected information on attitudes regarding the household division of labor.

We use a sample of respondents (men and women) between 20 and 45 years old living in countries that took part in the survey both years. These countries are Australia, Austria, Germany (West), Great Britain and Northern Ireland, Ireland, Japan, Netherlands, New Zealand, Norway, Spain, Sweden, and the United States. Some Eastern European and developing countries are also part of the 1994 and 2002 ISSP data. However, due to the differences in economic systems and demographic processes they are left out of the analysis.

### 3.1 Definition of variables and summary statistics

We first construct an *individual egalitarian index* that captures a person's attitudes, and calculate the mean of this index for each country and year to construct a *country egalitarian index* that captures social norms. Another example on the use of a principal component index in a similar context as here can be found in Alesina and Giuliano (2007). The individual egalitarian index is constructed as the first principal component of eight attitudinal questions using all the individuals in each country and year. These questions come in the form of statements to which respondents either agree or disagree and are coded on a 1 to 5 scale from *strongly agree* to *strongly disagree*. The statements are the following: (1) "A working mother can establish just as warm and secure a relationship with her children as a mother who does not work." (2) "A preschool child is likely to suffer if his or her mother works." (3) "All in all, family life suffers when the woman has a full-time job." (4) "A job is all right, but what most women really want is a home and children." (5) "Being a housewife is just as fulfilling as working for pay." (6) "Having a job is the best way for a woman to be an independent person." (7) "Both the man and woman should contribute to the household income." (8) "A man's job is to earn money; a woman's job is to look after the home and family."

Column 1 in Table 1 shows the variation across countries in the *country egalitarian index*. By construction the index has a standard normal distribution. Countries are ordered from more to less egalitarian according to the average value of the egalitarian index in both years. A higher value of the index means more egalitarian social norms. Sweden, Norway, the UK, and the US stay highest in the ranking, with values ranging from .43 to .08. Austria, Australia, Germany, and Japan stay at the bottom of the list in both years, with negative values of the egalitarian index ranging between −.11 and −.16.

Columns 2 to 9 in Table 1 show the percentage of individuals with more egalitarian views (i.e. those who agree or strongly agree with statements one, six, and seven above, and disagree or strongly disagree with the other statements). Generally more egalitarian countries score better with respect to the attitudinal questions. This is particularly the case for the attitudinal

**Table 1** Egalitarian norms and individual attitudes[1,2]

| | Egalitarian index | Attitudes 1 | Attitudes 2 | Attitudes 3 | Attitudes 4 | Attitudes 5 | Attitudes 6 | Attitudes 7 | Attitudes 8 |
|---|---|---|---|---|---|---|---|---|---|
| Sweden | 0.43 | 0.73 | 0.62 | 0.56 | 0.47 | 0.40 | 0.58 | 0.81 | 0.82 |
| Norway | 0.24 | 0.64 | 0.59 | 0.52 | 0.57 | 0.48 | 0.41 | 0.63 | 0.83 |
| Great Britain | 0.08 | 0.67 | 0.51 | 0.52 | 0.58 | 0.33 | 0.53 | 0.58 | 0.75 |
| U.S | 0.08 | 0.76 | 0.46 | 0.50 | 0.43 | 0.23 | 0.50 | 0.60 | 0.64 |
| Northern Ireland | 0.02 | 0.74 | 0.60 | 0.57 | 0.52 | 0.37 | 0.65 | 0.73 | 0.74 |
| Netherlands | −0.00 | 0.72 | 0.43 | 0.42 | 0.52 | 0.42 | 0.51 | 0.32 | 0.76 |
| Ireland | −0.03 | 0.70 | 0.59 | 0.53 | 0.51 | 0.36 | 0.62 | 0.73 | 0.77 |
| Spain | −0.08 | 0.67 | 0.46 | 0.42 | 0.54 | 0.55 | 0.79 | 0.89 | 0.79 |
| New Zealand | −0.11 | 0.58 | 0.40 | 0.47 | 0.63 | 0.33 | 0.39 | 0.38 | 0.74 |
| Japan | −0.11 | 0.72 | 0.42 | 0.42 | 0.36 | 0.13 | 0.44 | 0.46 | 0.50 |
| Germany | −0.13 | 0.78 | 0.28 | 0.34 | 0.63 | 0.53 | 0.76 | 0.68 | 0.65 |
| Austria | −0.15 | 0.77 | 0.24 | 0.27 | 0.55 | 0.47 | 0.79 | 0.80 | 0.52 |
| Australia | −0.16 | 0.64 | 0.46 | 0.45 | 0.49 | 0.31 | 0.42 | 0.44 | 0.73 |
| Mean | 0.00 | 0.70 | 0.46 | 0.45 | 0.53 | 0.39 | 0.58 | 0.63 | 0.72 |
| Observations | 13567 | 13567 | 13567 | 13567 | 13567 | 13567 | 13567 | 13567 | 13567 |

*Notes:* [1]Countries are ordered from more to less egalitarian social norms according to the average value of the egalitarian index in both years. Higher values of the egalitarian index indicate more egalitarian social norms. [2]Higher values for the *Attitudes* measures indicate a more egalitarian country. In particular, attitudes 1, 6, and 7 represent the percentage of individuals who agree or strongly agree with statements one, six, and seven below; Attitudes 2, 3, 4, 5, and 8 represent the percentage of individuals who disagree or strongly disagree with the corresponding statements below. The statements are the following: (1) "A working mother can establish just as warm and secure a relationship with her children as a mother who does not work." (2) "A pre-school child is likely to suffer if his or her mother works." (3) "All in all, family life suffers when the woman has a full-time job." (4) "A job is all right, but what most women really want is a home and children." (5) "Being a housewife is just as fulfilling as working for pay." (6) "Having a job is the best way for a woman to be an independent person." (7) "Both the man and woman should contribute to the household income." (8) "A man's job is to earn money; a woman's job is to look after the home and family"

questions two, three, and eight, which are the most important loadings in the index. It is worth noting that certain attitudinal questions get an overall higher acceptance value than others. This is the case for statements one, seven and eight, with values well over 70 percent, as opposed to the others that take values around 50 percent.

There are two remarks to be made about these statements. First, these statements clearly reflect the excluding nature that the decisions of market work versus family life entail, at least for women. Although at first glance the majority of these questions could be thought of as directly alluding to attitudes regarding women's role in the marketplace, the framing of the questions always confront market work to some aspect of home production (usually childcare), and thus bare direct implications for women's role at home. Second, most of the statements refer to women's role except the last two questions, which specifically refer to a man's role. However, to the extent that men and women are substitutes in household labor (both home labor and market labor), any of the statements regarding women's role can be interpreted in terms of men's role and viceversa.

Column 1 in Table 2 presents the percentage of respondents who have ever been in a partnership. A respondent is considered to have ever been in a partnership if he or she is either currently married or has ever been married, or if the respondent is currently living with a partner in a long-lasting relationship. The data do not allow any distinction between respondents who are married and respondents who are cohabiting. The cross-country relationship between social norms and being in a partnership is clearly positive. We observe that more egalitarian countries such as Norway and Sweden seem to have a higher proportion of individuals in partnerships than do other less egalitarian countries such as Japan or Spain.

Columns 2 to 6 in Table 2 show other country-specific variables that might affect the costs or gains of entering a partnership across countries. First the ratio of men to women is shown in column 2. Column 3 shows the female unemployment rate reported by the OECD. Although the ratio of men to women does not seem to be different across countries, the female unemployment rate seems to be greater for less egalitarian countries, something we ought to consider in Section 4. Column 4 to 6 show the proportion of individuals with positive attitudes toward marriage, cohabitation, and divorce respectively. These variables are calculated as the proportion of respondents in a given country and year who answer either *strongly agree* or *agree* to the following statements: "To what extent do you agree or disagree...?: (1) Married people are generally happier than unmarried people; (2) It is all right for a couple to live together without intending to get married; and (3) Divorce is usually the best solution when a couple can't seem to work out their marriage problems." The answers to these statements take five values and range from *Strongly agree* to *Strongly disagree*. Whereas the two most egalitarian countries, Sweden and Norway, are also the countries where the majority of individuals approve of cohabitation and divorce, there are also countries such as Austria, one of the least egalitarian countries, with a similar proportion of individuals with

**Table 2** Summary statistics[1,2]

| | Proportion in a partnership | Sex ratio | Female unemployment | Proportion of respondents with positive views regarding: | | | Education | | | Number of observations |
|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | Marriage (4) | Cohabitation (5) | Divorce (6) | Men (7) | Women (8) | Ratio (9) | (10) |
| Sweden | 0.77 | 0.47 | 6.63 | 0.15 | 0.83 | 0.52 | 12.49 | 12.65 | 1.00 | 724 |
| Norway | 0.84 | 0.46 | 4.29 | 0.15 | 0.75 | 0.50 | 13.58 | 13.32 | 0.98 | 1302 |
| Great Britain | 0.72 | 0.44 | 5.40 | 0.24 | 0.66 | 0.58 | 12.55 | 12.56 | 1.00 | 1161 |
| U.S | 0.71 | 0.42 | 5.84 | 0.42 | 0.43 | 0.45 | 13.73 | 13.57 | 0.99 | 1190 |
| Northern Ireland | 0.72 | 0.43 | 5.70 | 0.30 | 0.48 | 0.57 | 11.84 | 11.61 | 1.01 | 590 |
| Netherlands | 0.72 | 0.46 | 6.50 | 0.15 | 0.84 | 0.71 | 14.46 | 13.47 | 0.93 | 1249 |
| Ireland | 0.66 | 0.46 | 9.24 | 0.31 | 0.54 | 0.53 | 12.58 | 12.94 | 1.03 | 752 |
| Spain | 0.65 | 0.48 | 24.10 | 0.26 | 0.67 | 0.76 | 13.23 | 13.05 | 1.01 | 1781 |
| New Zealand | 0.80 | 0.42 | 6.59 | 0.23 | 0.58 | 0.50 | 12.94 | 13.00 | 1.00 | 757 |
| Japan | 0.72 | 0.46 | 3.84 | 0.36 | 0.38 | 0.32 | 13.46 | 12.86 | 0.96 | 743 |
| Germany | 0.84 | 0.51 | 7.39 | 0.34 | 0.67 | 0.67 | 11.54 | 11.80 | 0.97 | 1169 |
| Austria | 0.78 | 0.40 | 3.91 | 0.34 | 0.70 | 0.75 | 12.72 | 11.75 | 0.99 | 1007 |
| Australia | 0.78 | 0.49 | 8.03 | 0.43 | 0.60 | 0.55 | 12.51 | 12.57 | 1.00 | 1142 |
| Observations | 13567 | 13567 | 13567 | 13567 | 13567 | 13567 | 5870 | 7697 | 13567 | 13567 |

*Notes:* [1]Countries are ordered from more to less egalitarian social norms toward the household division of labor. [2]Female Unemployment Rates come from the OECD library at http://stats.oecd.org/wbos/index.aspx

positive views toward divorce and cohabitation. Thus, *a priori* there is no clear correlation between a country's egalitarian index and the costs associated with entering a household as captured by these aggregate variables.

Years of schooling have generally been used in the literature as a measure of market human capital as well as a measure of the returns to household production, thus reflecting both the potential outside opportunities to marriage (or cohabitation) and the gains from household specialization for women. Years of schooling are not significantly different across countries. In fact, the women-to-men years of schooling ratio is small for all countries and differences across countries are not significant. There is also a weak relationship between years of schooling and household formation rates. This weak correlation, together with the small variation in education ratios across countries, may suggest that differences in female human capital, while important in explaining differences in partnership formation, cannot fully explain the cross-country differences observed in the data.

## 4 Empirical results

Column 1 in Table 3 presents the results from estimating Eq. (1) for the main sample of men and women without survey-year or country dummies. In all the specifications the reported coefficients are the marginal effects from a probit model and represent the change in the probability of forming a household due to an infinitesimal change in each independent, continuous variable and, by default, the discrete change in the probability of forming a household for dummy variables. Results are presented for the joint sample of men and women and all the controls are interacted with a man dummy. Main results follow when men and women are considered separately, although significance in the coefficients is reduced due to smaller sample sizes.

The coefficient of interest is the *egalitarian index* coefficient $\beta_2$, which captures the relationship between a country's social norms and an individual's household formation probability. This coefficient is positive and significant, suggesting that an individual living in a more egalitarian country has a higher probability of forming a household. The positive relationship between more egalitarian social norms and an individual's probability of forming a household is the same for men and women irrespectively, given that the coefficient of the interaction between gender and the *egalitarian index* is neither statistically nor economically significant.

A positive coefficient on the *egalitarian index* is consistent with our theoretical motivation by which more egalitarian social norms decrease the costs of providing home labor for men, and thus increase the gains from forming a household by increasing the level of household produced goods. In particular one standard deviation (one unit increase) in the *egalitarian index* is associated with a decline of 8.5 percentage points in the probability of forming a household. For example, the average Japanese, with a country egalitarian index of

**Table 3** Social norms, individual attitudes, and the probability of forming a household[1,2,3]

| | (1) Pooled | (2) Year and country FE | (3) Other country variables | (4) Individual attitudes |
|---|---|---|---|---|
| Country egalitarian index | 0.084*** | 0.209** | 0.538*** | 0.563*** |
| | (0.03) | (0.11) | (0.15) | (0.15) |
| Country egalitarian index × Man dummy | 0.030 | 0.032 | −0.305 | −0.342* |
| | (0.04) | (0.07) | (0.19) | (0.19) |
| Individual egalitarian index | | | | −0.037*** |
| | | | | (0.01) |
| Individual egalitarian index × Man dummy | | | | 0.053*** |
| | | | | (0.01) |
| Proportion of men to women | | | 1.022* | 0.930 |
| | | | (0.57) | (0.57) |
| Proportion of men to women × Man dummy | | | 0.051 | 0.163 |
| | | | (0.54) | (0.54) |
| OECD Female unemployment | | | −0.016** | −0.015** |
| | | | (0.01) | (0.01) |
| OECD Female unemployment × Man dummy | | | 0.010*** | 0.008** |
| | | | (0.00) | (0.00) |
| Proportion who think married people happier | | | 0.694 | 0.515 |
| | | | (0.43) | (0.43) |
| Proportion of married people happier × Man dummy | | | −0.615 | −0.505 |
| | | | (0.41) | (0.41) |
| Proportion who think cohabitation OK | | | 0.620 | 0.491 |
| | | | (1.18) | (1.16) |
| Proportion cohabitation OK × Man dummy | | | −0.278 | −0.210 |
| | | | (0.29) | (0.29) |
| Proportion who think divorce OK | | | −2.165*** | −2.032*** |
| | | | (0.42) | (0.41) |
| Proportion divorce OK × Man dummy | | | 0.849* | 0.733 |
| | | | (0.49) | (0.49) |
| Individual attitudes toward marriage | | | | 0.142*** |
| | | | | (0.01) |
| Individual attitudes toward marriage × Man dummy | | | | −0.125*** |
| | | | | (0.03) |
| Individual attitudes toward cohabitation | | | | 0.002 |
| | | | | (0.01) |
| Individual attitudes toward cohabitation × Man dummy | | | | −0.009 |
| | | | | (0.02) |
| Individual attitudes toward divorce | | | | −0.005 |
| | | | | (0.01) |
| Individual attitudes toward divorce × Man dummy | | | | −0.035** |
| | | | | (0.02) |
| Years of education | −0.012*** | −0.012*** | −0.014*** | −0.012*** |
| | (0.00) | (0.00) | (0.00) | (0.00) |
| Years of education × Man dummy | 0.003** | 0.005*** | 0.008*** | 0.006*** |
| | (0.00) | (0.00) | (0.00) | (0.00) |
| Age | 0.025*** | 0.025*** | 0.026*** | 0.025*** |
| | (0.00) | (0.00) | (0.00) | (0.00) |
| Age × Man dummy | 0.004*** | 0.004*** | 0.004*** | 0.004*** |
| | (0.00) | (0.00) | (0.00) | (0.00) |
| Man dummy | −0.286*** | −0.330*** | −0.451 | −0.477 |
| | (0.04) | (0.05) | (0.31) | (0.30) |
| 2002 dummy | | −0.022 | −0.136** | −0.131** |
| | | (0.02) | (0.06) | (0.06) |

**Table 3** (continued)

| | (1) Pooled | (2) Year and country FE | (3) Other country variables | (4) Individual attitudes |
|---|---|---|---|---|
| 2002 dummy × Man dummy | | −0.012 | 0.069** | 0.066** |
| | | (0.02) | (0.03) | (0.03) |
| Country dummies | No | Yes | Yes | Yes |
| R sq. | 0.180 | 0.192 | 0.195 | 0.209 |
| Observations | 13567 | 13567 | 13567 | 13567 |

*Notes:* [1]The reported coefficients are the marginal effects from a probit model and represent the change in an individual's probability of forming a household due to an infinitesimal change in each independent variable. [2]Standard errors in parenthesis. [3] ***Significant at the 1% level. **Significant at the 5% level. *Significant at the 10 % level

−.11, has a probability of forming a household that is about 4 percentage points lower than its Swedish counterpart living in a country with an egalitarian index of .43. Social norms can thus explain at least half of the difference in household formation rates that is found in the raw data.

These results go in line with descriptive evidence from time-use data suggesting that countries with higher household formation rates are also the countries with higher contributions to home labor by men. For example, despite home labor being still a woman's task, there is enormous variation in men's involvement in childcare and household tasks across developed countries. For example, in the US men spend about 48 percent as much time doing child care as women. In contrast, in Italy and Germany the figure is 39 and 37 percent respectively (e.g. Guryan et al. 2008). Similarly, weekly hours devoted to housework by Japanese men is 3.5 versus 13.8 hours by US men (e.g., Juster and Stafford 1991). More recent time-use studies reveal that just about 70 percent of Spanish and Italian men engage in household activities in any given day versus 92 percent of Swedish men (e.g., EUROSTAT 2004).

Column 2 in Table 3 includes year and country dummies to account for both permanent differences across countries over the survey period, and changing factors over time in all countries. The size of the *egalitarian index* coefficient is higher than in the previous specification, and its magnitude more than doubles with respect to specification (1). In particular, one standard deviation of the index leads to a 21 percentage points increase in the probability of entering a household. This increase in the size of the coefficient suggests that omitting year and country fixed effects results in an underestimation of the effect of social norms on an individual's household formation probability. In fact, the survey-year coefficient is negative (although not significant), which suggest a decreasing trend in the probability of forming a household of around 2 percentage over the survey period.

As discussed in Section 2 controlling for year and country fixed effects does not allow us to differentiate whether the $\beta_2$ coefficient captures the effect of social norms, or whether this coefficient is just capturing the effect of other country-specific factors that affect the costs associated with entering a household and in turn an individual's probability of entering a partnership.

We thus control for marriage market characteristics such as the ratio of men to women, labor market characteristics such as the female unemployment rate, and the proportion of individuals in a country with positive views toward marriage, cohabitation, and divorce.

The ratio of men to women is commonly used in the marriage market literature to control for the conditions of the household market, which reflect the different costs of entering a household in different countries. For example Grossbard and Amuedo-Dorantes (2008) 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. The coefficient of this variable is positive and significant.

Similarly, we include the female unemployment rate in order to capture the labor market prospects of women in the countries considered. According to our theoretical motivation an egalitarian social norm works via the effect of the household division of labor. However, egalitarianism presumably also has implications for the relative labor market prospects of men and women. In particular, women living in more egalitarian societies may face less wage discrimination and can thus afford to stay single. In other words, women who face less wage discrimination would be less willing to leave the labor market and would be less likely to enter a household since the gains from specialization in home production are lower. Interestingly, this is the opposite of the results shown so far and would imply that the positive coefficient on the egalitarian index shown in Specification 2 was, if anything, biased downward. Nonetheless, including the female unemployment rate in the regression is interesting in and of itself to give us a sense of the size of the bias.[4]

The coefficient on the female unemployment rate is negative and significant, especially for women. This negative coefficient does not seem to go in line with the above discrimination story, however it makes sense in a context of high levels of structural unemployment, as was the case for the least egalitarian countries in our sample such as in Spain during the 90's. Long term unemployment, particularly affecting women workers of all ages, has been argued to carry a lifetime income penalty because its associated drop in human-capital accumulation significantly increases the risk of future unemployment and lower future wages (e.g., Adsera 2004, 2005). This negative income effect is particularly severe when the market exit happens early in a career. Since entering a union is particularly demanding in terms of household production in less egalitarian countries, it is possible that women rather postpone entering a household or give up entering a household altogether until they accumulated sufficient human capital. Another interpretation could be that the coefficient on the female unemployment rate is capturing the effect that a particular

[4] Alternative specifications included the male unemployment rate. Main results followed, although the effect of unemployment was harder to identify given the high correlation between male and female unemployment rates.

individual is unemployed (and thus its chances to find a mate are diminished). One way to check this would be to add the individual's employment status at the time of forming a household. Unfortunately this is not possible because the data do not contain this information.

The last set of country aggregate variables we control for are the proportion of individuals in a country who think that *married people are happier*, that *cohabitation is OK*, and that *divorce is OK*. The first two variables most likely capture either existing social norms regarding each of these household formation processes *per se* or social policies promoting each kind of household formation (such as the legal recognition of de facto relationships enacted in most countries since the mid 80's (e.g., Kiernan 2007).

As seen in Section 3, more egalitarian countries seem to have higher acceptance rates of divorce and norms toward divorce. Acceptance of divorce in a country may capture the benefits or costs of forming a household in general that if omitted in the regression, it might cause a bias in the egalitarian index coefficient. The sign of the bias is however undetermined *a priori*. On the one hand a positive sign on the coefficient of the proportion of people who think divorce is OK may capture the fact that in those countries where divorce is more widely accepted there is either a lower social stigma attached to divorce or more favorable laws regarding divorce. Either interpretation may reflect lower household dissolution costs, which we may expect to increase an individual's household formation probability. On the other hand, a negative sign on the divorce coefficient could equally well suggest 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.

Neither the proportion of individuals in a country with positive views regarding marriage nor cohabitation have a significant effect on an individual's probability of entering a household. The coefficient on the proportion of individuals who think positively about divorce is however highly negative for both men and women. This negative coefficient is consistent with the latter argument and may suggest that the gains from forming a household in those countries where divorce is more widely accepted are lower. An alternative explanation is that the negative effect of divorce norms operates through the labor market, for example if more egalitarian countries have less wage discrimination leading to a lower benefit to household formation and the specialization that follows. The fact that the divorce coefficient remains significant after we control for women's labor market prospects (such as the female unemployment rate) makes this hypothesis less likely.

In conclusion, after including these country-level variables the *egalitarian index* coefficient continues to be highly significant and more than doubles with respect to the specification in Column 2. This increase suggests that omitting these variables leads to a downward bias of the effect of social norms and that the *egalitarian index* coefficient in Column 2 of Table 3 may most likely have been capturing the fact that countries that have become more egalitarian over

the survey period also have increased the costs of entering a household for any individual living there.

### 4.1 Social norms and individuals' attitudes

As mentioned in Section 2 the correlation between social norms and individual attitudes poses a potential problem for the previous empirical results if individual attitudes are associated with an individual's probability of forming a household. If this is the case, the coefficient of the *egalitarian index* $\beta_2$ in Eq. (2) would be capturing the effect of preferences rather than the effect of social norms. The remainder of this section explores this issue by adding a control for individual preferences as specified in Eq. (3).

Although the personal views about the household division of labor held by each individual are clearly endogenous to the decision of forming a partnership, including these views in the regression can still shed some light onto the presence of social effects associated with an individual's household formation probability. It can also inform us on whether the *egalitarian index* coefficient is merely picking up the effect of an individual's views regarding the household division of labor. We tackle the endogeneity problem at the end of this section as the data best allow us to do and show that the main results do not change.

Column 4 in Table 3 shows the results from adding a control for an individual's reported attitudes. This variable is constructed as the individual egalitarian index described in Subsection 3.1. Incorporating individual attitudes does not change the sign or the significance of the country's *egalitarian index* coefficient. Its size increases slightly by 3 percentage points to about 56 percentage points. This increase in the size of the *egalitarian index* coefficient supports the presence of social effects net of individual attitudes and suggests that social norms are not just capturing the effect of individual preferences.

Another interesting result from Column 4 is that as predicted by the theory the effects of individual attitudes and social norms run in the same direction for men, whereas the effects run in opposite directions for women. The negative sign on the coefficient on a woman's reported individual attitudes toward the household division of labor is −0.037. In other words, whereas *ceteris paribus* being a more egalitarian woman is associated with a lower probability of entering a household by 3.7 percentage points, a woman living in a more egalitarian country has, everything else being equal, a higher probability of entering a household by 56 percentage points. Individual attitudes are, however, positively associated with a man's probability of entering a household. The interaction of individual attitudes and the man dummy is .053, which means that a more egalitarian man has a higher probability of entering a household by 0.016 percentage points. A p-value close to zero indicates that we can overwhelmingly reject the null that these two coefficients are the same at the 99 per cent level.[5]

[5]The chi-squared value of the test statistic is 46.22.

The specification in Column 4 also controls for individual attitudes toward marriage, cohabitation, and divorce. Although these attitudes are clearly endogenous, introducing these variables into the analysis can nonetheless inform us on whether the coefficients on the proportion of people in a country with positive views toward cohabitation and divorce are capturing the effect of policies or social norms regarding household formation, or whether these variables are just capturing an individual's taste regarding being in a couple. Introducing these attitudinal variables does not greatly change the coefficients on the proportion of individuals who think positively about marriage, cohabitation, and divorce. In particular, the proportion of individuals who think divorce is OK continues to be negative and significant as before, which suggests that this country-specific variable is indeed capturing country-level factors that affect an individual's cost of forming a household, rather than just capturing an individual's preferences toward forming a household *per se*.

Finally, the coefficients on the rest of individual characteristics are as expected and remain stable across all specifications. Education and age capture market human capital as well as the productivity in household production, and thus reflect the opportunity costs faced by individuals when deciding whether to enter or not enter a household. An increase of one year of schooling diminishes a woman's probability of forming a union by 1.2 percentage points. This coefficient is .8 for men. The small size of this coefficient, together with the fact that the cross-country educational differences are not significant, suggests that female education cannot explain the full picture of the variation in household formation rates across countries. The coefficient on age is positive and significant as expected. An increase in one year of age increases the probability of being in a household by 2.6 percentage points for women and 3.1 for men.[6]

## 5 Robustness checks

### 5.1 Dealing with the endogeneity of individual attitudes

One concern with the results presented in Column 4 of Table 3 is that individual attitudes can be endogenous to the probability of forming a household, i.e., individuals might become more egalitarian after a household is formed, or viceversa. Thus, it is quite possible that the responses to the attitudes questions are influenced by prior experience regarding household formation which will bias the coefficients. One way to deal with this endogeneity problem is to take into account the number of partnerships that individuals have been into. Unfortunately, we do not have data on the number of marriages or cohabitations.

[6]Specifications using quadratic in age lead to qualitatively the same results. The coefficient on the quadratic term is significant but relatively very small, so that the concavity starts to kick in at age 100, which is a rather high number for our sample. Results available upon request.

Although we know whether an individual has been married before (i.e., we know which individuals are divorced), we do not have information about those individuals who where in a cohabiting union and broke up.

Instead of following the above route we take an instrumental variables approach to deal with the endogeneity problem and use data on family background as an instrument for predicting individual attitudes. In particular we use information on whether the mother worked when they were fourteen years old. This approach is not new to the literature, for example Fernández et al. (2004) use a similar instrument to present intergenerational evidence in favor of the hypothesis that a significant factor of the increase in female labor force participation over time was the presence of men who grew up in a different family model - one in which the mother worked.

Panel A in Table 4 presents the result from the two-step probit estimator used here. Although the coefficients on the individual attitudes are no longer significant, the egalitarian index remains significant and highly positive as before. Appendix A describes this IV estimator and the first-stage coefficients are presented in Table 5. In both first-stage regressions the F statistic is well above the commonly used threshold of 10, which suggests that whether the mother worked when the respondent was 14 years old can explain some of the variation in attitudes later in life. Nonetheless, a Wald test of exogeneity of individual attitudes reveals that we cannot reject the null that there is no endogeneity, which suggest that the results presented before may be more appropriate.

### 5.2 Other robustness checks

We also check whether our results are robust to a different specification of social norms. Panel B in Table 4 presents the main estimating coefficients when social norms are defined as the average by country and year of the individual answers to the attitudinal question number (3): *Do you agree or disagree: Family life suffers when woman works full time.* We choose this attitudinal variable because it is the loading that contributed the most when constructing the principal component that gave rise to the *egalitarian index* presented in Section 3. This variable takes values from 1 to 5, with 1 being *strongly agree* and 5 being *strongly disagree*. Thus, higher values of this variable are associated with more egalitarian attitudes.

Although the sizes of the coefficients on this variable and the sizes of the *egalitarian index* presented previously are not readily comparable because they are in different scales, the sign of the *social norms* coefficient is again as expected. The social norm coefficient measured in this way continues to have a positive sign, meaning that individuals living in more egalitarian countries have a higher probability of entering a household. Also, as predicted by the theory, the relationship between an individual's attitudes toward the household division of labor and an individual's household formation probability is different for a man than for a woman. In particular, the effect of individual attitudes on

**Table 4** Social norms, individual attitudes, and the probability of forming a household: robustness checks[1,2,3]

| | (1) Pooled | (2) Year and country FE | (3) Other country variables | (4) Individual attitudes |
|---|---|---|---|---|
| Panel A: IV approach to endogeneity of attitudes | | | | |
| Country egalitarian index | | | | 1.899*** |
| | | | | (0.53) |
| Country egalitarian index | | | | −1.133* |
| × Man dummy | | | | (0.65) |
| Individual egalitarian index | | | | −0.035 |
| | | | | (0.21) |
| Individual egalitarian index | | | | 0.095 |
| × Man's dummy | | | | (0.28) |
| Country dummies | | | | Yes |
| R sq. | | | | 0.196 |
| Wald test of exogeneity | | | | 0.91 |
| N | | | | 13241 |
| Panel B: Egalitarian norms using attitude question 3 | | | | |
| Country year average attitude (3) | 0.035 | 0.149* | 0.391*** | 0.402*** |
| | (0.02) | (0.08) | (0.10) | (0.10) |
| Country year average attitude (3) | 0.028 | −0.112 | −0.303** | −0.302** |
| × Man dummy | (0.03) | (0.10) | (0.12) | (0.12) |
| Individual attitude (3) | | | | −0.014** |
| | | | | (0.01) |
| Individual attitude (3) | | | | −0.015 |
| × Man dummy | | | | (0.01) |
| Country dummies | No | Yes | Yes | Yes |
| R sq. | 0.180 | 0.191 | 0.195 | 0.210 |
| N | 13567 | 13567 | 13567 | 13567 |
| Panel C: Excluding Germany | | | | |
| Country egalitarian index | 0.072** | 0.196* | 0.412*** | 0.453*** |
| | (0.03) | (0.11) | (0.15) | (0.15) |
| Country egalitarian index | 0.048 | 0.074 | 0.000 | −0.074 |
| × Man dummy | (0.05) | (0.08) | (0.21) | (0.21) |
| Individual egalitarian index | | | | −0.036*** |
| | | | | (0.01) |
| Individual egalitarian index | | | | 0.049*** |
| × Man dummy | | | | (0.01) |
| Country dummies | No | Yes | Yes | Yes |
| R sq. | 0.180 | 0.192 | 0.196 | 0.209 |
| N | 12398 | 12398 | 12398 | 12398 |

*Notes:* [1]The reported coefficients are the marginal effects from a probit model and represent the change in an individual's probability of forming a household due to an infinitesimal change in each independent variable. [2]Standard errors in parenthesis. [3] ***Significant at the 1% level. **Significant at the 5% level. *Significant at the 10 % level

a woman's probability of entering a household runs opposite to the effect of social norms.

The last robustness check is presented in Panel C of Table 4, which shows the results after excluding observations from Germany. We take observations from Germany out of the sample because Germany experienced a very high increase in the *egalitarian index* over the survey years, from −.23 to .14. This

**Table 5** First-stage OLS regression of individual attitudes[1,2,3]

| | (1) | (2) |
|---|---|---|
| Mother ever worked at age 14 | 0.180*** | 0.000 |
| | (0.02) | (0.01) |
| Mother worked × Man dummy | 0.041 | 0.223*** |
| | (0.03) | (0.02) |
| Country egalitarian index | 1.157*** | 0.414** |
| | (0.27) | (0.18) |
| Country egalitarian index × Man dummy | 0.071 | −0.050 |
| | (0.37) | (0.24) |
| Proportion of men to women | −1.739 | 0.790 |
| | (1.13) | (0.73) |
| Proportion of men to women × Man dummy | 1.973* | −1.413** |
| | (1.08) | (0.70) |
| OECD Female unemployment | −0.000 | −0.012 |
| | (0.01) | (0.01) |
| OECD Female unemployment × Man dummy | −0.009 | 0.033*** |
| | (0.01) | (0.00) |
| Proportion who think married people happier | 0.818 | −0.196 |
| | (0.86) | (0.55) |
| Proportion of married people happier × Man dummy | 0.400 | 0.569 |
| | (0.84) | (0.54) |
| Proportion who think cohabitation OK | −6.474*** | −1.321 |
| | (2.29) | (1.48) |
| Proportion cohabitation OK × Man dummy | 0.937 | 0.467 |
| | (0.58) | (0.38) |
| Proportion who think divorce OK | −0.079 | −0.843 |
| | (0.80) | (0.52) |
| Proportion divorce OK × Man dummy | −2.309** | 0.782 |
| | (0.98) | (0.63) |
| Individual attitudes toward marriage | −0.303*** | −0.003 |
| | (0.03) | (0.02) |
| Individual attitudes toward marriage × Man dummy | 0.014 | −0.282*** |
| | (0.04) | (0.02) |
| Individual attitudes toward cohabitation | 0.436*** | −0.002 |
| | (0.03) | (0.02) |
| Individual attitudes toward cohabitation × Man dummy | −0.005 | 0.443*** |
| | (0.04) | (0.03) |
| Individual attitudes toward divorce | 0.060*** | 0.001 |
| | (0.02) | (0.01) |
| Individual attitudes toward divorce × Man dummy | 0.024 | 0.079*** |
| | (0.03) | (0.02) |
| Years of education | 0.072*** | 0.009*** |
| | (0.00) | (0.00) |
| Years of education × Man dummy | −0.014*** | 0.032*** |
| | (0.00) | (0.00) |
| Age | −0.000 | 0.000 |
| | (0.00) | (0.00) |
| Age × Man dummy | −0.001 | −0.002 |
| | (0.00) | (0.00) |
| Man dummy | −0.536 | −0.861** |
| | (0.62) | (0.40) |
| 2002 dummy | 0.218* | −0.010 |
| | (0.12) | (0.08) |
| 2002 dummy × Man dummy | −0.060 | 0.078* |
| | (0.07) | (0.05) |
| Country dummies | Yes | Yes |

**Table 5** (continued)

| | (1) | (2) |
|---|---|---|
| First stage F-statistic [p-value] | 75.91 [0.00] | 98.52 [0.00] |
| R sq. | 0.157 | 0.143 |
| N | 13241 | 13241 |

*Notes:* [1]The reported coefficients come from an OLS model where the dependent variable is individual attitudes toward the household division on labor. [2]Standard errors in parenthesis. [3] ***Significant at the 1% level. **Significant at the 5% level. *Significant at the 10 % level

increase moved Germany from the bottom of the egalitarianism ranking in 1994 to the top of the ranking in 2002, whereas the position in the ranking of the other countries remained fairly stable across the survey years. The coefficient on the egalitarian index remains virtually unchanged suggesting that the strong positive effect of social norms shown in Section 4 is not driven by the observations from Germany.

## 6 Concluding remarks

This paper studies the cross-country differences in household formation rates as an important contributor to the study of below replacement fertility and the economic challenges associated with it. It offers a social norms interpretation to explain an individual's probability of entering a household.

In the empirical analysis we first provide an identification strategy for social effects that relies on the time and cross-country variation in the data. This method allows for the identification of country-specific social norms net of other social interaction effects. A second identification strategy comes from using an individual's reported attitudes toward the household division of labor, which allows for the identification of social norms beyond individual preferences.

We find that individuals living in more egalitarian countries are more likely to enter a household. Furthermore, individual attitudes run opposite to social norms for the case of women. Whereas *ceteris paribus* a more egalitarian woman has a lower probability of forming a household, a woman living in a more egalitarian country has, *ceteris paribus*, a higher probability of forming a household. These findings are consistent with social norms affecting an individual's household formation probability by decreasing a man's costs of providing home labor, which results in an increase of the production of household public goods and the gains from forming a union.

Our findings prove especially relevant for *lowest-low* fertility countries such as Italy, Japan, and Spain. In particular, our most conservative coefficient suggests that social norms explain a substantial proportion of observed differences in household formation rates between Japan and Spain (the two *lowest-low* fertility countries in our sample), and Sweden (the most egalitarian country in our sample). The explained difference accounts for 4 percentage points, which

amounts to half of the difference in household formation rates observed in the raw data.

The demographic evidence suggests that the fraction of couples living together without being married is higher in Scandinavian countries (e.g., Kiernan 2004). These countries have also been shown here to have more egalitarian norms. It can be argued that the costs associated with forming a non-marital household are lower than those associated with a marital union. Due to limitations in the data however, we cannot disentangle whether the results shown in this paper come from the type of household being formed, i.e., from marital or non-marital unions. Given that children born within marriage are less likely to see their parents separate than those born in a non-marital union (especially if this union does not result in a marriage afterwards), investigating how social norms affect marital and cohabiting unions differently may prove very useful to the extent that partnership dissolution affects the economic and psychological wellbeing of children. We leave this interesting question for future research.

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## Appendix A: First-stage regressions

We use a two-stage probit regression that is used to control for the endogeneity of the individual attitudes toward the household division of labor in an individual's household formation decision.[7] The first-stage regressions use ordinary least squares to predict individual attitudes as a function of the mother's work experience when the respondent was fourteen and explanatory variables from the second-stage household formation equation as:

$$x_{i,t,k} = W_{i,t,k}\beta_1 + m_{i,t,k}\beta_2 + mg_{i,t,k}\beta_3 + \varepsilon_{i,t,k} \tag{4}$$

and

$$xg_{i,t,k} = W_{i,t,k}\beta_1 + m_{i,t,k}\beta_2 + mg_{i,t,k}\beta_3 + \varepsilon_{i,t,k} \tag{5}$$

where $x_{i,t,k}$ is individual attitudes toward the household division of labor and $xg_{i,t,k}$ is the interaction of individual attitudes with the man dummy. $W_{i,t,k}$ is a vector of demographic and economic variables that enter in the second stage regression. $m_{i,t,k}$ is an indicator variables that takes value one if the respondent's mother was working when the respondent was fourteen and zero otherwise, and $mg_{i,t,k}$ is the interaction of $m_{i,t,k}$ with the man dummy respectively. The first-stage coefficients are presented in Table 5.

[7] See Chun and Oh (2004) for another example of the two-stage probit estimator presented here.

The household formation equation is thus expressed as:

$$y_{i,t,k} = W_{i,t,k}\beta_1 + \widehat{x}_{i,t,k}\beta_2 + \widehat{xg}_{i,t,k}\beta_3 + \varepsilon_{i,t,k} \quad (6)$$

where $y_{i,t,k}$ is a dummy variable for the household formation decision, which equals one if the respondent has ever formed a household and is zero otherwise, and $\widehat{x}_{i,t,k}$ and $\widehat{xg}_{i,t,k}$ are respectively the predicted individual attitudes and its interaction with the man dummy from the first-stage regressions.

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