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Cristina Borra
Martin Browning
Almudena Sevilla

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Cristina Borra

Universidad de Sevilla

Martin Browning

University of Oxford

Almudena Sevilla

Queen Mary University of London and IZA

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ABSTRACT

Marriage and Housework

This paper provides insights into the welfare gains of forming a couple by estimating how much of the difference in housework time between single and married individuals is causal and how much is due to selection. Using longitudinal data from Australia, UK and US, we find that selection into marriage by individuals with a higher taste for home-produced goods can explain about half of the observed differences in housework documented in the cross-sectional data. There remains a genuine two-hour increase in housework time for each partner upon marriage, with women specializing in routine, and men specializing in non-routine housework tasks.

JEL Classification: D13, J12, J22

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Corresponding author:

Almudena Sevilla
Queen Mary University of London
School of Business and Management
Mile End Road
London E1 4NS
United Kingdom
E-mail: A.Sevilla@qmul.ac.uk

1. Introduction

In this paper we document and explore the mechanisms behind the differences in housework between single and married individuals ('marrieds'). Specifically, we estimate how much of the substantial difference is causal and how much is due to selection into marriage. Spouses' time constitutes an important input into the production of household public and private goods. Across industrialized countries, men spend about 20 hours per week on home production, and women about 30 hours per week. This exceptional amount of time (which excludes the time devoted to child care) is mostly used for the production of household public goods, such as having a clean house, or cooking a home-made meal. The sharing of these household public goods and services, the so-called *commodities* (see Becker (1965)), forms the basis for arguably one of the most important efficiency gains associated to marriage, above marital gains from extended credit, risk pooling, and increased specialization (Lam, 1988).

This paper starts from our observations of a robust finding on housework and marriage. We use cross-sectional time-diary data for eleven industrialized countries to document that, for all countries considered, married (or cohabiting) individuals do much more housework than comparable single individuals. Married women devote about eight more hours per week to housework than single women from an average of 25 hours per week, although there is a great dispersion in the additional housework time across countries. This increase in housework upon marriage is concentrated in routine housework tasks such as cleaning, cooking, and ironing, which need to be performed on a regular basis. Married men do about half an hour less of routine housework tasks per week than single men, but they do about two hours more of non-routine housework (such as DIY and managing finances) than singles. Taken together, a couple spends 15 percent longer in housework-related tasks than two singles. These findings are not a result of specialization in the labour market, and are robust to controlling for hours of paid work and a wide set of covariates such as the number of children.

The differences in housework between singles and marrieds can be broadly attributed to either direct effects (state dependence) or selection. Current available data are not well suited for distinguishing the different explanations for the direct effects. Instead we focus on how much of the effect observed in the cross-section data can be attributed to selection into being married; that is, unobserved characteristics to

marrying individuals that are correlated with preferences for home produced goods and services. Whereas selection into marriage has been previously suggested as a potential explanation for differences in housework time between marrieds and singles (Auspurg et al. 2014, Stratton 2015), this hypothesis has never been tested. We exploit the longitudinal nature of three panel data sets to explore the selection hypothesis: the Panel Study of Income Dynamics (PSID), the British Household Panel Survey (BHPS), and the Household, Income and Labour Dynamics in Australia (HILDA) Survey. For the latter we have information on both routine housework and non-routine housework, whereas for the PSID and BHPS we only have information on routine housework.

We show that selection can go a long way in explaining the differences in routine housework upon marriage. Between about 30 and 60 per cent of the increase of routine housework upon marriage can be accounted for by unobserved heterogeneity for women. Similarly, the decrease in routine housework upon marriage observed in the cross-section virtually vanishes once selection is taken into account for men. There remains what seems to be a genuine increase in routine housework upon marriage of about two hours for women. In the case of non-routine housework, results from the HILDA Survey suggest that there are no selection effects. Instead, the two hour increase in non-routine housework observed in the cross-section analysis for men is a genuine increase that persists even after controlling for unobserved heterogeneity.

Our paper first contributes to the existing literature on the welfare gains of forming a couple, which is crucial for the analysis of individual decisions regarding union formation and dissolution (Chiappori et al 2002, 2017, Bruze et al. 2015). A long line of research in the social sciences has focused on household specialization by studying the differences between the time that men and women devote to household production activities (Pollak 2012, 2013). The focus of this literature is on the division of labour within marriage, rather than on the changes in the time devoted to home labour upon marriage (Becker 1965, Gronau 1977, Grossbard-Shechtman 1984, Couprie 2007). Here we look at how and why the time devoted to home labour changes upon marriage. We are the first paper providing robust evidence on the causal impact of marriage on time allocated to home production across different developed countries using longitudinal data spanning over two decades.

Second, our paper contributes to a long tradition in Economics trying to identify the economies of scale associated to changes in the size of the household (for instance

Deaton and Paxson, 1997). These economies of scale rest on the idea that two can live more cheaply than one, and monetary income is the focus. However, economists have long been sensitive to how much economic activity escapes the market economy (see Krueger et al. (2009)). Our paper is a first attempt to understand the nature of the differences between singles and marrieds that moves beyond monetary income to identify individual living standards from household time data.

The paper is organized as follows. Section 2 documents the increase in unpaid labour upon marriage by providing harmonised cross-national evidence drawn from time-use surveys. Section 3 very briefly (and informally) uses economic theory to review the various direct effects that may be operative and justifies our focus on identifying selection effects. Section 4 uses longitudinal data to look at the role of unobserved heterogeneity in explaining the cross-sectional results. Section 5 concludes.

2. Cross-sectional relationship between marriage and housework

We use 24-hour time diary surveys from the harmonized Multinational Time Use Study Data set (MTUS) in 9 industrialized countries to document the increase in home labour upon marriage. Diary surveys collect information on a respondent's activities during a 24-hour period, and the diary is completed on a selected day, either on a weekday or on a weekend day or in both days (see Table A.1 in Appendix A for a description of these surveys). MTUS data have been harmonized to minimize differences in survey methodology, and the use of 24-hour diary surveys minimizes comparability issues across surveys in time use categories (see for example Guryan et al., 2008 for a discussion about the conceptualization and comparability of child care time using these surveys). The reliability and validity of MTUS diary data is well established in the literature. Indeed, most studies documenting long term trends in how individuals use their time are based on time-use diaries (Aguiar and Hurst 2007, Gimenez-Nadal and Sevilla 2012, Ramey and Ramey, 2010), which have become the preferred method to collect information on time spent on different activities just as money expenditure diaries have become the gold standard for describing consumption behaviour.

We use a cross-sectional sample of working-age individuals from Austria (1992), Canada (1998), France (1998), Germany (2001), Italy (2003), Norway (2000), Spain

(2001/02), the United Kingdom (2000/2001) and the USA (2003-08). We restrict the sample to respondents between 24 and 65 years. Throughout the paper we compare the time spent in housework of *singles* (i.e, single individuals not living in the parental home) and *marrieds* (i.e, individuals who are in a partnership, either legally married or cohabiting).

The variable of interest is time doing housework, which is measured in hours per week. We follow the literature and construct our housework variable from the diary, adding up the time spent in cooking and washing up, odd jobs, gardening, shopping, household finances, and household related travel as in Stratton and Stancanelly (2014) and Aguiar and Hurst (2007) (see Table A.2 in Appendix A for a full description of these housework categories). We also distinguish between routine and non-routine housework. Women tend to specialize in routine housework, which is composed of tasks that constitute a daily routine. In the time use data these activities are coded as cooking, cleaning, washing, ironing, shopping, and household related travel. Men tend to specialize in non-routine housework, i.e., tasks that do not need to be done on a daily or regular basis. These activities are coded in the time use data as household repairs, vehicle maintenance, pet care, and gardening. Compared to routine housework, non-routine housework can often be postponed and is easier to outsource (see Hersch 1991, Hersch and Stratton, 2002).

Tables 1 and 2 present the results from an OLS regression of housework activities H_i for individual i on an indicator variable for being married or cohabiting M_i for a sample with and without children. These estimates can be interpreted in a descriptive way, as simple means of housework for each country for married and cohabiting individuals versus single individuals. Table 3 then presents the same OLS regression controlling for socio-economic characteristics as in:

$$H_i = \alpha + \beta_1 X_i + \beta_3 M_i + \varepsilon_i \quad (1)$$

where H_i denotes minutes per week devoted to housework by individual i , and X_i is a vector of covariates that includes age, age squared, household size, number of children, education level dummies, hours of paid work in the diary day, and day of the week dummies.

The raw data in Table 1 compares the hours per week spent in housework for married men and women versus single men and women. There are marked gender

differences in terms of housework time, which are already visible in the single state. Single women tend to spend about 25 hours per week on housework (Column 1), whereas single men spend about 15 hours per week (Column 2). Gender differences are accentuated for married individuals. Married women do on average 8 hours and a half more of housework per week than single women (Column 1), whereas married men do about half an hour less of housework per week than single men (Column 2). As a result Column 3 reveals that housework time is higher upon marriage. A couple spends about 6 more hours (20 percent longer) in housework-related tasks than two singles who spend about 21 hours each. Table 2 shows that the marriage effect on housework is not being driven by other transitions, such as having children. When individuals with no children are considered, the same patterns are observed. Married women with no children do about 10 hours of housework more than childless single women, who spend about 25 hours per week in housework. Interestingly, married men with no children do on average about one more hour of housework than single childless men (although there is still great variation across countries).

There is a lot of heterogeneity across countries in terms of the marriage effect on housework and we cannot reject that the change in housework upon marriage may be different across countries (see F-statistic in last row of Table 1). Women's housework increases by about 2 more hours per week in Norway, and almost 11 more hours per week in Italy. The variation in men's housework time upon marriage is also very heterogeneous across countries. It increases about two hours upon marriage in Canada, Norway, and the United States, but decreases about three hours in Austria, France, and Spain. In Germany, Italy, The Netherlands and the United Kingdom married men do the same amount of housework as single men. Despite this cross-country variation in the amount of housework, the marked negative correlation between the increases of housework upon marriage for women and men remains. In particular, in those countries where housework differences between married and single women are highest, housework differences between married and single men are lowest (see Figure 1).

The results in Table 1 and 2 may well be driven by other factors unrelated to the marital status of the individual. For example, married individuals may devote more time to housework because there are more persons in the households (such as children or other adults), or because they work less in the labour market. In Table 3 we run the

same OLS regressions as in Table 1 controlling for observed individual and household characteristics that could partially explain differences in housework time between married and single individuals. In particular we include the age, age squared, education level dummies, the number of children below the age of 18 living in the household, dummies for the age group of the youngest child in the household, the day of the week the diary referred to, and minutes of paid work in the diary day. Table A1 in Appendix A provides summary statistics for these variables for men and women respectively, and Table A.2 reports full estimation results.

The first row of Table 3 shows that on average, once we control for socio-economic characteristics, marriage continues to have a bigger effect on housework for women than for men. Women increase the amount of housework upon marriage by about 5 hours (Column 1 in Table 3), instead of 8 hours (Column 1 in Table 1). The increase in housework is entirely driven by increases in routine housework, as non-routine housework either decreases or stays the same. Compared to women, married men do on average more than one hour and a half less routine housework than single men, but almost two hours more non-routine housework than single men.

The rest of the rows in Table 3 show that average results also hold in each of the countries considered. Married women do more routine housework than single women, and married men do more non-routine housework than single men. The difference between married and single individuals varies across countries (the χ -statistics in the last row of Table 2 shows that we cannot reject that the marriage effect is different across countries). Married women in the UK do almost 3 hours more of routine housework than single women, whereas married women in Austria do up to 6 hours more of routine housework than single women. Similarly, Italian married men do 1 hour and 15 minutes more non-routine housework than single men, whereas Norwegian married men do about 3 hours and 15 minutes more of non-routine housework than single men.

3. Interpreting the data

Very broadly there are two classes of explanation for the differences we see between singles and comparable marrieds: *state dependence* and *selection*. State dependence refers to effects that arise directly from being together compared to living

separately; selection involves differences arising because of non-random participation in the marriage market.

Under a simple household model where the spouses have separate utility functions over both public and private goods, and public goods are produced in the home using market goods and spouses' time, the sources of state dependence are myriad and ambiguous for housework (Becker 1965, 1981, Lam 1988, Browning et al 2013). First, there are economies of scale in time use, arising mainly from production complementarities within the household (Lundberg 2012, Crossley and Lu 2004). For instance, cooking a meal for two does not take twice as much time as cooking meals for two singles. Another example is cleaning; because of setup costs it does not take twice as much time to clean a dwelling for two as for two single dwellings (Vernon 2010, Stratton 2015). This effect would tend to reduce total housework for marrieds if other direct effects were not operative.

A second direct effect arises because some commodities that were necessarily private when single now become public. Examples include a 'clean house' or managing finances. This changes the mix of goods that are optimal for co-habiting couples as compared to when they were single which in turn has an impact on time use within the household; see Lam (1988), Deaton and Paxson (1998), Crossley and Lee (2004), and Browning et al. (2014).

A third direct effect arises if preferences change on living together (Michaud and Vermeulen 2011, Browning et al. 2013, and Cherchye et al. 2016). An example would be that eating at home is now relatively more attractive than eating in restaurants when single. If the change in preferences is towards commodities that are produced using housework, then this will increase time spent on housework (Stratton 2012, 2015). Finally, if we allow for net affect as suggested by Kahneman and Krueger (2006), doing housework together may be more or less onerous than doing the same housework alone; see Sullivan (1996), Hamermesh (2002), Jenkins and Osberg (2003), and Kahneman et al. (2004).

It would be very desirable to have a model that allowed us to distinguish between these different direct effects; unfortunately the data requirements are far beyond what we have in household surveys that include time use information. For example, some of the effects discussed posit several private and public goods with

differential home production inputs but we do not have such information on expenditures in this detail in any time use survey. In the rest of this paper we do not attempt to model the different direct effects but rather concentrate on how much of the differences between singles and comparable marrieds can be attributed to selection. For example, 'tidier' individuals may be more likely to select themselves into marrying (or cohabiting), so that the patterns described in the cross-sections in Section 2 would be consistent with a selection story.

4. Selection into Marriage and Housework: Evidence from Longitudinal Data

The patterns described in the cross-sections in Section 2 can be consistent with a selection story if individuals with a higher preference for certain housework tasks are also those who marry, either because they are more inclined to form a joint household or because they are perceived as more desirable partners. There is indeed evidence of higher marriage rates in countries where men contribute more to home production, see for example Sevilla-Sanz (2010), Burda et al. (2013), and Bertrand et al (2016). In this section we control for selection into marriage by individuals with a higher taste for housework services (or the household public good produced with home labour) in order to isolate the potential bias in the cross-sectional estimates presented in Section 2. To this end we use panel data with information on housework tasks to control for time-invariant unobserved individual characteristics such as innate ability, which may be associated with the predisposition towards market work and away from housework as well as the tendency towards forming a joint household.

We use the 1992-2011 Panel Study of Income Dynamics (PSID), the 1992-2008 British Household Panel Survey (BHPS), and the 2002-2013 Household, Income and Labour Dynamics in Australia (HILDA). These surveys use stylized-type questions, which are aimed to capture time spent in housework. In the PSID the respondent answers for both partners: "About how much time does the head (wife) spend on housework in an average week? I mean time spent cooking, cleaning, and doing other work around the house?". This information was collected each wave, except from 2005 onwards that is collected every two waves. The BHPS asks a similar question of each adult in the household every wave. In particular, the BHPS asks "About how many hours do you spend on housework in an average week, such as time spent cooking, cleaning and doing the laundry?". HILDA asks "About how many hours do you spend on housework in an average week, such as time spent cooking, cleaning and doing the

laundry?" from each person over 14 years-old every wave. These questions clearly refer to a narrow definition of routine housework, which as shown in Section 1 is relatively higher among married women relative to single women and men.

We restrict the main sample to women between 24 and 65 years of age during 1992-2011 (in the PSID) or 2008 (in the BHPS) in order to have similar years for the PSID and the BHPS samples, and 2002-2013 for the HILDA sample as no earlier data is available. Regression results using a PSID sample from 1985, the first year the housework variable was asked, are robust (see Appendix Table B.4). We also limit the sample to those respondents who have undertaken a transition from single to married/cohabitation, or who have always been married/cohabiting or always single during the sample period. As in our cross-sectional analysis in Section 1, we only consider individuals not living in the parental home. The final sample includes only those observations for which we have information for all the variables.¹

In order to assure comparability with the cross-sectional results from the MTUS in Section 1, we run OLS regressions similar to those in Equation (1) and presented in Table 2, and using as dependent variable a definition of routine housework similar to that used by the PSID and BHPS (see Table B.1 in Appendix B). This comparison cannot be conducted for Australia, as the Australian time diary data is not available to researchers outside Australia. Cross-sectional results from the panel data sets (BHPS and PSID) and from the corresponding MTUS surveys from Table 1 yield very similar coefficients on marriage, indicating that the two types of housework measures (from the diary in MTUS and from the stylized questions in PSID and BHPS) are roughly equal in terms of reliability (see also Hill (1985), and Robinson (1985) for similar comparisons). Given that there is no panel diary survey that would allow us to undertake the analysis aimed in this section, these panel data sets seem the best suited data for the task at hand.

¹ Out of the 83178 women in the PSID sample, we select 54662 from years 1992-2011. We further select 42475 aged 25 to 64. The sample is then reduced to 27694 by dropping those ever divorced or widowed and to 27046 because of missing observations and finally to 26413 so that all women included in the sample were observed at least twice, as those marrying. For the BHPS, out of the 118458 women we select 78639 from 1992 onwards; we further select 77832 aged 25 to 64. The sample is then reduced to 37386 by dropping those ever divorced or widowed, to 35899 by dropping those still living in the parental home, and to 35150 because of missing observations and finally to 34554 so that all women included in the sample were observed at least twice. For HILDA, out of the 126983 female observations in the sample, we select 108780 in the original sample from 2002 onwards; we further select 56125 aged 25 to 64. The sample is then reduced to 41097 by dropping those ever divorced or widowed, to 39381 by dropping those still living in parental home, and to 32838 because of missing observations and finally to 31926 so that all women included in the sample were observed at least twice, as those marrying.

Column (1) in Table 4 shows that there are 3059 (3084 or 3762) women who are always married during the sample period in the PSID (BHPS or HILDA), and 295 (253 or 363) women who are always single. About 5 per cent of the women transit to the marriage state during the sample period, 175 in the PSID, 127 in the BHPS, and 191 in HILDA. The numbers are very similar for men (see Column (1) in Panel B in Table 4). Columns (2) and (3) show the average time spent in routine housework for those women who are always single, who transit into marriage, and who are always married during the sample period. For women marrying during the sample period, the difference due to marriage is 4.86 hours of routine housework per week in the PSID, and 3.47 hours of routine housework per week in the BHPS, which is close to the cross-section value calculated with MTUS data for the US and the UK in Table 3. Australian longitudinal data reveals a similar pattern to those in the US and the UK. In particular, Australian women marrying during the sample period do 3.04 hours more of routine housework per week. Similarly, women who are always married during the sample period have 9.47 (9.07 or 8.10) hours more than the always single in the PSID (BHPS or HILDA).

Similar comparisons for men from Columns (4), (5), and (6) in Table 4 reveal a mixed picture for changes in routine housework time for men marrying during the sample period across the three countries. Taken together, the evidence from men transiting into the married state, and comparisons between the always married and always single, seem to suggest lower housework time in the married state. However, as with the cross-sectional evidence on routine housework shown in Table 3, the mean estimates are less precise.

Table 4 shows that in all three surveys, women who marry during the sample period have a lower value of housework when they marry (13 hours per week) than the always married (about 18 and a half hours per week). Compared to women, men who marry during the sample period tend to have higher levels of housework (about 6 and a half hour per week) than men who are always married during the sample (about 6 hours per week). These figures do not take into account the differences between the groups in observables that also influence housework. Figure 2 shows the distribution of residuals from a regression of housework on the number of rooms, age, age squared, education, and education crossed with age, as well as three variables capturing the impact of children (see Table B2 in Appendix B for the definition of covariates in the

different surveys, and Table B3 in Appendix B for summary statistics). The overall mean of these residuals is, of course, zero but the distribution is right skewed and the median is negative. As expected, compared to the results in Table 4, the marrying sample looks very much like the always singles in their first period (when they are single) and like the always married in the final period of observation (when they are married) once we control for observable characteristics.

Table 5 presents the main results from regressing hours of housework per week on marital status and a series of covariates (a quadratic on age, education at age 25 in years, an interaction term of age and years of education, a logarithm in the number of children, and number of household rooms), first using a simple OLS regression framework as in Section 1, and then controlling for individual fixed effects as in Equation 2.²

$$H_{i,t} = \alpha + \beta_1 X_{i,t} + \beta'_3 M_{i,t} + \varepsilon_{i,t} \quad (2)$$

where H_i denotes minutes per week devoted to housework by individual i , and X_i is a vector of covariates that includes a quadratic on age, education at age 25 in years, an interaction term of age and years of education, a logarithm in the number of children, and number of household rooms (see Table B.1 for variable definitions and Table B.2 for summary statistics).

Results from Table 5 first show that controlling for unobserved heterogeneity changes the coefficient on the married dummy, which indicates that part of the changes in routine housework upon marriage are due to selection into marriage. Second, the direction of selection runs in the opposite directions for women and men. In particular, compared to women, who are more likely to marry when they have an ex-ante higher preference for routine housework, men with a lower taste for routine housework are more likely to live in a couple.

Column (1) shows that the marriage coefficient for the women sample more than halves once permanent unobserved heterogeneity is accounted for. In particular, the marriage coefficient drops from 6 additional hours per week under an OLS model to 1.99 hours of housework per week under a Fixed Effects model in the PSID, from 3.89 to 2.61 hours per week in the BHPS, and from 4.06 to 1.50 hours per week in HILDA. Using data from two waves of the US National Survey of Families and Households and

² A Hausman test rejects the RE null.

controlling for unobserved heterogeneity, Gupta (1999) also finds that women increase the time they spend in routine housework by about four hours when they form couple households. Column (2) shows results for men. According to the OLS results married men do between 0.70 and 1.70 hours less of housework per week than single men. However, once we control for unobserved heterogeneity, the coefficient goes down in absolute value, and in some cases is no longer significant, suggesting that actual housework decreases upon marriage are not as severe as the cross-sectional results suggest.

A Chi2 test rejects the null that the OLS and the FE coefficients are the same, suggesting selection into marriage biased the OLS results presented in Section 1. Taken together, between 65 per cent (in the PSID and HILDA) and 33 per cent (in the BHPS) of the increase of routine housework upon marriage for women can be accounted for by unobserved heterogeneity. However although selection can explain a significant part of the cross-section variation in housework, there remains what seems to be a genuine increase in routine housework upon marriage of about two hours for women in all three countries. Compared to women, the decrease in routine housework upon marriage observed in the cross-section for men virtually vanishes once selection is taken into account. Selection seems to explain most of the decrease in housework time upon marriage for men, accounting for between 100 per cent (in the PSID and HILDA) and 60 per cent (in the BHPS).

Results based on routine housework seem to suggest a gender imbalance with respect to the effects of marriage on housework time. In contrast to women, where there is a genuine increase in routine housework time upon marriage, routine housework upon marriage either stays the same (in Australia and the US) or decreases (in the UK) for men. However Table 3 documented that married men did more non-routine housework than single men, so routine housework may not give a full picture of the variation of housework time. We observe a measure of non-routine housework in HILDA, which relates to outdoor housework activities such as gardening and home repairs. In particular, HILDA asks “How much time would you spend on Outdoor tasks, including home maintenance (repairs, improvements, painting etc.), car maintenance or repairs and gardening in a typical week?”

Results in Table 6 provide a fuller picture of the effect of marriage on housework time by looking at what happens to non-routine housework upon marriage. Column (1)

in Table 6 shows that the two-hour per week increase of routine housework for married women relative to single women observed in Table 5 is compensated by a similar increase in non-routine housework for married men relative to single men. Thus, the net effect on housework time from marriage seems to be similar for men and women once a more comprehensive measure of housework is considered. In particular, total housework increases by 2.21 hours per week for women, and by 2.02 hours per week for men. Compared to Column (1), comparisons of OLS and FE coefficients in Column (2) in Table 6 reveals no selection effects regarding non-routine housework, for either men or women, suggesting that the increases in non-routine housework for men are genuine and happen after marriage.

5. Conclusion

This paper documents changes in home labour upon forming a household and explores in depth one possible explanation: selection effects. Using cross-sectional data for a wide range of high-income countries we document that married women do about five more hours per week of housework than single women. Compared to married women, men's housework time is just half an hour per week higher when married than when single. Differences in housework across marital states persist after conditioning on a wide set of observables such as age, education, and the number and age of children. The fact that these findings follow even after controlling for time spent in the labour market suggest that there are other gains from marriage that go beyond the efficiency gains derived from specialization in paid work.

Results from fixed effects estimates using longitudinal data for the US, the UK, and Australia suggest that selection into marriage can account for a substantial portion of the cross-section variation in housework upon marriage, particularly with respect to routine housework activities such as cooking and cleaning. We also show that the direction of selection runs in opposite directions for women and men. In particular, compared to women, who are more likely to marry when they have an ex-ante higher preference for routine housework, men with a lower taste for routine housework are more likely to tie the knot. Selection accounts for between about 30 and 60 per cent of the increase of routine housework upon marriage for women, and all the decrease in routine housework upon marriage observed in the cross-section for men.

After selection is accounted for, there remains a genuine increase of housework for men and women upon marriage of about two hours per week. Women increase routine housework upon marriage, such as meal preparation and cleaning. In contrast men increase the time spent in non-routine housework (such as outdoor and maintenance activities).

The policy implications of our results are two-fold. First, a common evaluating tool used by policy-makers is the equivalence scale, which precisely tries to measure the economies of scale associated to the formation of households in order to adjust household income for size and composition of households. Our results can inform public welfare policies interested in inferring the right incomes needed by households of different sizes and compositions to reach a given standard of living. Second, the gender specialization across housework tasks upon marriage cannot be overlooked and should inform the design of policies interested in the distributional effects across households. Compared to non-routine housework, routine housework needs to be performed on job days and is difficult to postpone or contract out. Thus routine housework is more likely to infringe a penalty upon labour market activities and wages (see Hersch (1991) and Hersch and Stratton (2002)).

References

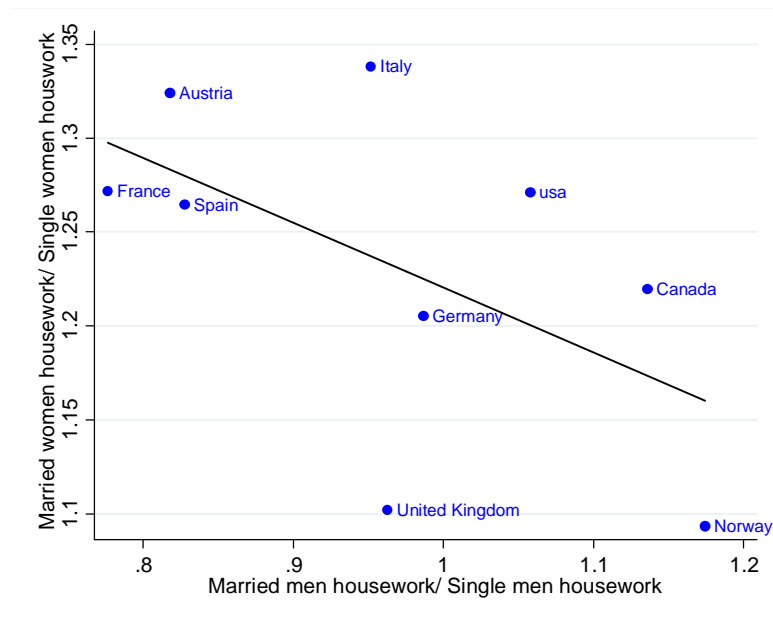
- Aguiar, M. and Hurst, E. 2007. "Measuring Trends in Leisure: The Allocation of Time Over Five Decades" *Quarterly Journal of Economics*, 122: 969-1006.
- Auspurg, K., Iacovou, M., and Nicoletti, C. 2014. "Housework Share between Partners: Experimental Evidence on Gender Identity," IZA Discussion Papers 8569.
- Becker, G. 1965. "A Theory of the Allocation of Time" *Economic Journal*, 75: 493–517.
- Becker, G. 1981. *A treatise on the Family*. Cambridge, MA: Harvard University Press.
- Bertrand, M., Cortes, P., Olivetti, C., and Pan, J. 2016. "Social Norms, Labor Market Opportunities, and the Marriage Gap for Skilled Women," NBER Working Papers 22015.
- Browning, M., Chiappori, P.A., and Weiss, Y. 2014. "The gains from marriage", *Economics of the Family*, Cambridge, MA: Cambridge University Press.
- Browning, M., Chiappori, P.A., and Lewbel, A. 2013. "Estimating Consumption Economies of Scale, Adult Equivalence Scales, and Household Bargaining Power," *Review of Economic Studies*, 80(4), 1267-1303.
- Bruze, G., Svarer, M., and Weiss, Y. 2015. "The Dynamics of Marriage and Divorce." *Journal of Labor Economics* 33:1, 123-170
- Burda, M., Hamermesh, D. and Weil, P. 2013. "Total work and gender: facts and possible explanations," *Journal of Population Economics*, 26(1), 239-261.
- Cherchye, L., De Rock, B., Surana, K., and Vermeulen, F. 2016. "Marital Matching, Economies of Scale and Intrahousehold Allocations," IZA Discussion Papers 10242, Institute for the Study of Labor (IZA).
- Chiappori, P.A., Fortin, B. and Lacroix, G. 2002. 'Marriage market, divorce legislation, and household labor supply', *Journal of Political Economy*, vol. 110(1), pp. 37–72.
- Chiappori, P.A., Iyigun, M., Lafortune, J. and Weiss, Y. 2017. "Changing the Rules Midway: The Impact of Granting Alimony Rights on Existing and Newly Formed Partnerships." *The Economic Journal*. doi:10.1111/ecoj.12385
- Couprie, H. 2007. "Time allocation within the Family: Welfare implications of life in a couple." *The Economic Journal*, 117: 287–305.
- Crossley, T. and Lu, Y. 2005. "Exploring the returns to scale in food preparation (baking penny buns at home)," IFS Working Papers W05/03, Institute for Fiscal Studies.
- Deaton, A., and Paxson, C. 1998. "Economies of Scale, Household Size, and the Demand for Food." *Journal of Political Economy*, 106, 897–930.
- Giménez-Nadal, J.I. and Sevilla, A. 2012. "Trends in Time Allocation: A Cross-Country Analysis", *European Economic Review*, 56(6), 1338-1359.
- Gronau, R. 1977. "Leisure, Home Production, and Work-The Theory of the Allocation of Time Revisited" *Journal of Political Economy*, 85(6): 1099-1123.
- Grossbard-Shechtman, A. S. 1984. A theory of allocation of time in markets for labor and marriage. *Economic Journal*, 94, 863–882.
- Gupta, S. 1999. "The Effects of Transitions in Marital Status on Men's Performance of Housework." *Journal of Marriage and the Family* 61:700-711.
- Guryan, J., Hurst, E. and Kearney, M. (2008). "Parental education and parental time with children," *Journal of Economic Perspectives*, Summer 2008: 23-46.

- Hamermesh, D., 2002. "Timing, togetherness and time windfalls." *Journal of Population Economics* 15, 601-623.
- Hersch, J. and Stratton, L. 2002. "Housework and Wages." *Journal of Human Resources* 37(1): 217-229.
- Hersch, J. 1991. "Male-Female Differences in Hourly Wages: the Role of Human Capital, Working Conditions, and Housework." *Industrial and Labor Relations Review* 44(4): 746-759.
- Hill, M. 1985. "Patterns of Time Use," In: Juster, T., Stafford, J., (Eds.) *Time, goods, and well-being*. Ann Arbor, MI: Institute for Social Research, The University of Michigan.
- Jenkins, S.P. and Osberg, L. 2004. "Nobody to play with? The implications of leisure coordination." In: Hamermesh, Daniel and Pfann, Gerard, (eds.) *The Economics of Time Use: Contributions to Economic Analysis*, 271. Elsevier, Amsterdam, The Netherlands, pp. 113-145.
- Kahneman, D. and Krueger, A.B. 2006. "Developments in the Measurement of Subjective Well-Being," *Journal of Economic Perspectives*, 20(1), 3-24.
- Kahneman, D., Krueger, A.B., Schkade, D., Schwarz, N., and Stone, A. 2004. "A Survey Method for Characterizing Daily Life Experience: The Day Reconstruction Method (DRM)", *Science*, 306(5702), 1776-80.
- Krueger, A.B., Kahneman, D., Schkade, D., Schwarz, N., and Stone, A., 2009. "National Time Accounting: The Currency of Life," NBER Chapters, in: *Measuring the Subjective Well-Being of Nations: National Accounts of Time Use and Well-Being*, pages 9-86, National Bureau of Economic Research, Inc.
- Lam, D. 1988. "Marriage Markets and Assortative Mating with Household Public Goods: Theoretical Results and Empirical Implications," *Journal of Human Resources*, 23(4), 462-487.
- Lundberg, S. 2012. "Personality and marital surplus," *IZA Journal of Labor Economics*, 1(1), 1-21.
- Michaud, P.C. and Vermeulen, F. 2011. "A collective labor supply model with complementarities in leisure: Identification and estimation by means of panel data," *Labour Economics*, 18(2), 159-167.
- Pollak, R.A. 2012. "Allocating Time: Individuals' Technologies, Household Technology, Perfect Substitutes, and Specialization," *Annals of Economics and Statistics*, 105-106, 75-97
- Pollak, R.A. 2013. "Allocating Household Time: When Does Efficiency Imply Specialization?," NBER Working Papers 19178, National Bureau of Economic Research, Inc.
- Ramey, G. and Ramey, V. A. 2010. "The Rug Rat Race". *Brookings Papers on Economic Activity*. Spring 129-176
- Robinson, J.P., 1985. "The validity and reliability of diaries versus alternative time use measures." In: Juster, T., Stafford, J., (Eds.) *Time, goods, and well-being*. Ann Arbor, MI: Institute for Social Research, The University of Michigan.
- Sevilla, A., 2010. "Household division of labor and cross-country differences in household formation rates." *Journal of Population Economics* 23, 225-249.

- Stancanelli, E. G. F. and Stratton, L. 2014. "Maids, Appliances and Couples' Housework: The Demand for Inputs to Domestic Production." *Economica*, 81: 445–467.
- Stratton, L. 2012. "The role of preferences and opportunity costs in determining the time allocated to housework." *American Economic Review, Papers and Proceedings*, 102(3), 606–11.
- Stratton, L. 2015. "The determinants of housework time" *IZA World of Labour* 133:1-10.
- Sullivan, O. 1996. "Time co-ordination, the domestic division of labour and affect relations: time-use and the enjoyment of activities within couples", *Sociology*, 30 (), pp. 79.100.
- Vernon, V. 2010. "Marriage: for love, for money...and for time?," Review of *Economics of the Household*, Springer, vol. 8(4), pages 433-457, December.

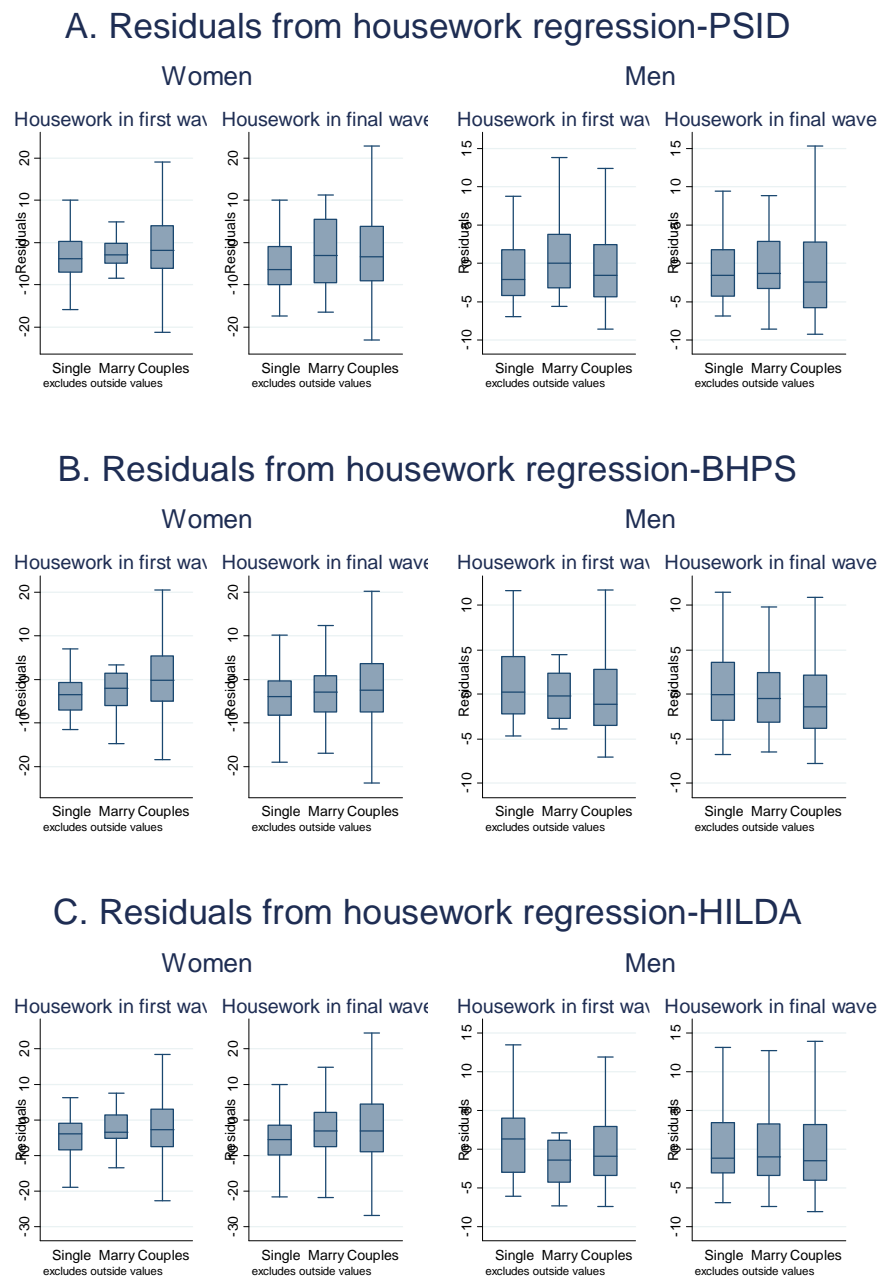
Figures

Figure 1 Relationship between housework performed by married women and married men relative to singles, by country.



Notes: Data source is the Multinational Time Use Study (MTUS). The sample consists of individuals between 24 and 65 years old not living in parental home. Housework is calculated as the time spent in cooking and washing up, odd jobs, gardening, shopping, finances, and household related travel measured in hours per week. We consider singles (i.e, single individuals not living in the parental home) and marrieds (i.e, individuals who are in a partnership, either legally married or cohabiting). In the x-axis we represent the average value of housework by married men divided by the average value of housework by single men. In the y-axis we represent the average value of housework by married women divided by the average value of housework by single women. A standard fitted OLS regression also shown.

Figure 2: Residuals from regressions of housework on controls. PSID, BHPS, and HILDA



Notes: Data comes from the 1992-2011 PSID, the 1991-2008 BHPS, and the 2002-2013 HILDA. Sample is women (men) between 24 and 65 years old, not living in the parental home, who have not been divorced, and who are observed in at least two waves. Each graph plots the residual from regressions of housework on a quadratic on age, education at age 25 in years, an interaction term of age and years of education, a logarithm in the number of children, and number of household rooms. In each panel the graphs show the residuals for three groups: those who are always single, those who marry from the first to the last wave and those who always live in a couple. We consider singles (i.e. single individuals not living in the parental home) and marrieds (i.e. individuals who are in a partnership, either legally married or cohabiting). Housework is reported in hours per week as the answer to the question “About how much time do you spend on housework in an average week? I mean time spent cooking, cleaning, and doing other work around the house?”, in PSID, “About how many hours do you spend on housework in an average week, such as time spent cooking, cleaning and doing the laundry?”, in BHPS, and “How much time would you spend on housework, such as preparing meals, washing dishes, cleaning house, washing clothes, ironing and sewing, in a typical week?” (variable lshw), in HILDA.

Table 1: Housework across married states: Evidence from cross-sectional data

	[1] Women				[2] Men				[3] Both			
	Single		Married		Single		Married		Single		Married	
All	25.13 (0.12)	***	8.58 (0.14)	***	16.39 (0.13)	***	-0.74 (0.14)	***	21.53 (0.10)	***	3.22 (0.11)	***
Austria	30.63 (0.54)	***	9.93 (0.60)	***	15.90 (0.63)	***	-2.90 (0.67)	***	25.80 (0.49)	***	1.61 (0.54)	**
Canada	24.30 (0.65)	***	4.95 (0.75)	***	15.35 (0.70)	***	2.10 (0.79)	**	20.16 (0.50)	***	3.09 (0.57)	***
France	24.05 (0.55)	***	6.53 (0.61)	***	15.52 (0.52)	***	-3.47 (0.57)	***	20.41 (0.44)	***	0.92 (0.48)	
Germany	25.95 (0.32)	***	5.41 (0.37)	***	17.86 (0.50)	***	-0.20 (0.53)		23.67 (0.29)	***	1.01 (0.32)	**
Italy	31.84 (0.44)	***	10.76 (0.48)	***	13.23 (0.40)	***	-0.64 (0.43)		23.96 (0.38)	***	4.15 (0.41)	***
Norway	24.05 (0.69)	***	2.34 (0.77)	**	16.21 (0.83)	***	2.72 (0.91)	**	20.23 (0.55)	***	2.37 (0.61)	***
Spain	30.60 (0.47)	***	8.12 (0.51)	***	14.73 (0.46)	***	-2.53 (0.49)	***	24.62 (0.41)	***	1.64 (0.44)	***
UK	27.10 (0.48)	***	2.84 (0.55)	***	17.05 (0.62)	***	-0.42 (0.67)		23.23 (0.40)	***	-0.05 (0.45)	
US	22.85 (0.15)	***	6.20 (0.19)	***	16.91 (0.18)	***	0.98 (0.21)	***	20.26 (0.12)	***	3.05 (0.15)	***
F-test of equality of means	72.07	***	636.24	***	17.39	***	311.50	***	28.97	***	122.25	***

Notes: Data source is the Multinational Time Use Study (MTUS). Countries are ordered in alphabetical order. The sample consists of individuals between 24 and 65 years old not living in the parental home. We consider singles (i.e, single individuals not living in the parental home) and marrieds (i.e, individuals who are in a partnership, either legally married or cohabiting). Housework is calculated as the time spent in cooking and washing up, odd jobs, gardening, shopping, finances, and household related travel measured in hours per week. OLS regressions of housework on a dummy for living with a partner (cohabiting or being married). Standard errors in brackets.

Table 2: Housework across married states: Evidence from cross-sectional data (Families with no children)

	(1)				(2)			
	Women		Men		Single		Married	
	Single	Married	Single	Married	Single	Married	Single	Married
All	24.16 (0.15)	10.14 (0.19)	16.01 (0.14)	0.80 (0.17)	***	***	***	***
Austria	29.45 (0.64)	10.23 (0.74)	15.59 (0.69)	-0.63 (0.77)	***	***	***	
Canada	22.49 (0.78)	5.35 (0.95)	14.75 (0.69)	3.44 (0.85)	***	***	***	***
France	22.74 (0.63)	8.12 (0.73)	15.10 (0.57)	-1.37 (0.67)	***	***	***	*
Germany	24.78 (0.45)	6.35 (0.53)	17.34 (0.54)	2.76 (0.62)	***	***	***	***
Italy	31.51 (0.49)	10.95 (0.55)	13.22 (0.42)	1.41 (0.48)	***	***	***	**
Norway	23.35 (0.91)	2.62 (1.08)	15.27 (0.86)	3.37 (1.05)	***	*	***	**
Spain	29.90 (0.56)	9.97 (0.63)	14.97 (0.51)	-1.54 (0.56)	***	***	***	**
UK	24.72 (0.66)	4.91 (0.76)	16.71 (0.63)	0.61 (0.74)	***	***	***	
US	21.40 (0.21)	6.90 (0.30)	16.52 (0.20)	2.60 (0.29)	***	***	***	***

Notes: Data source is the Multinational Time Use Study (MTUS). Countries are ordered in alphabetical order. The sample consists of individuals between 24 and 65 years old and not co-resident with children under 18 years-old. We consider singles (i.e, single individuals not living in the parental home) and marrieds (i.e, individuals who are in a partnership, either legally married or cohabiting). Housework is calculated as the time spent in cooking and washing up, odd jobs, gardening, shopping, finances, and household related travel measured in hours per week. OLS regressions of housework on a dummy for living with a partner (cohabiting or being married). Standard errors in brackets. *** Significant at the 1 percent level; ** significant at the 5 percent level; * significant at the 10 percent level.

Table 3: Housework and Marriage: Evidence from cross-sectional data

	(1) Women						(2) Men					
	Total		Routine		Non-routine		Total		Routine		Non-routine	
All	5.36	***	5.49	***	-0.13	*	0.13		-1.56	***	1.69	***
	(0.12)		(0.11)		(0.06)		(0.13)		(0.10)		(0.09)	
Austria	5.84	***	5.17	***	0.67	*	-2.43	***	-4.42	***	1.99	***
	(0.52)		(0.47)		(0.28)		(0.61)		(0.41)		(0.50)	
Canada	2.62	***	2.12	***	0.50		1.99	**	-0.35		2.34	***
	(0.64)		(0.57)		(0.38)		(0.72)		(0.55)		(0.54)	
France	3.91	***	4.50	***	-0.59	**	-2.71	***	-4.24	***	1.53	***
	(0.47)		(0.43)		(0.20)		(0.52)		(0.39)		(0.38)	
Germany	2.95	***	3.26	***	-0.31		1.33	**	-2.11	***	3.44	***
	(0.32)		(0.28)		(0.19)		(0.46)		(0.32)		(0.37)	
Italy	6.65	***	7.07	***	-0.42	*	-0.46		-1.67	***	1.21	***
	(0.36)		(0.35)		(0.18)		(0.37)		(0.28)		(0.26)	
Norway	2.87	***	3.21	***	-0.34		2.54	**	-0.67		3.21	***
	(0.65)		(0.62)		(0.27)		(0.86)		(0.72)		(0.55)	
Spain	5.06	***	4.90	***	0.16		-0.61		-2.00	***	1.39	***
	(0.41)		(0.38)		(0.22)		(0.44)		(0.33)		(0.31)	
UK	2.51	***	2.81	***	-0.30		1.42	*	-0.80		2.22	***
	(0.45)		(0.41)		(0.23)		(0.58)		(0.45)		(0.43)	
US	4.12	***	3.66	***	0.47	***	2.00	***	-0.04		2.04	***
	(0.17)		(0.15)		(0.09)		(0.21)		(0.16)		(0.14)	
Chi2 test of equality of coefficients	76.19	***	90.22	***	41.36	***	118.29	***	140.65	***	40.88	***

Notes: Data source is the Multinational Time Use Study (MTUS). Countries are ordered in alphabetical order. The sample consists of individuals between 24 and 65 years old. We consider singles (i.e, single individuals not living in the parental home) and marrieds (i.e, individuals who are in a partnership, either legally married or cohabiting). Total stands for total housework hours per week; routine refers to routine housework hours per week, including general household upkeep, cooking, washing up, shopping and domestic travel; and non-routine is non-routine housework in hours per week, including DIY activities, car maintenance, paying bills, and gardening. Housework is measured in hours per week. OLS regressions of housework on a dummy for cohabiting or being married, minutes spent in paid work during the diary day, age, age squared, household size, number of children, education level, and day of the week dummies. Standard errors in brackets. *** Significant at the 1 percent level; ** significant at the 5 percent level; * significant at the 10 percent level.

Table 4. Routine housework across married states: Evidence from longitudinal data

	Women			Men		
	(1) Observations	(2) Single	(3) Married	(4) Observations	(5) Single	(6) Married
Panel A. PSID						
Always single (not in parental home)	295	9.07		282	6.85	
Marrying (not from parental home)	175	7.83	12.69	239	6.79	8.16
Always married	3059		18.63	3246		6.96
Panel. B. BHPS						
Always single (not in parental home)	253	8.90		323	7.13	
Marrying (not from parental home)	127	9.11	12.58	152	6.20	5.67
Always married	3084		17.97	3031		5.39
Panel. C. HILDA						
Always single (not in parental home)	363	10.45		447	7.12	
Marrying (not from parental home)	191	10.23	13.27	211	5.98	6.36
Always married	3762		18.55	3615		6.15

Notes: Data comes from the 1992-2011 PSID, the 1991-2008 BHPS, and the 2002-2013 HILDA. Sample is women (men) between 24 and 65 years old, not living in the parental home, who have not been divorced, and who are observed in at least two waves. We consider singles (i.e, single individuals not living in the parental home), marrieds (i.e, individuals who are in a partnership, either legally married or cohabiting), and marrying (i.e. individuals who transition from single to married). Housework is reported in hours per week as the answer to the question "About how much time do you spend on housework in an average week? I mean time spent cooking, cleaning, and doing other work around the house?", in PSID, "About how many hours do you spend on housework in an average week, such as time spent cooking, cleaning and doing the laundry?", in BHPS, and "About how many hours do you spend on housework in an average week, such as time spent cooking, cleaning and doing the laundry?" (variable lshw), in HILDA.

Table 5. Housework and marriage: Evidence from longitudinal data

	(1) Women		(2) Men	
	Coefficient	Standard Error	Coefficient	Standard Error
Panel A: Routine Housework (PSID)				
OLS	6.00	(0.40)***	-0.69	(0.26)**
FE	1.99	(0.59)***	0.71	(0.32)**
Chi2 test of equality of coefficients	34.68***		8.83***	
N obs.	3529		3767	
Panel B: Routine Housework (BHPS)				
OLS	3.89	(0.43)***	-1.79	(0.24)***
FE	2.61	(0.44)***	-0.71	(0.25)**
Chi2 test of equality of coefficients	4.97**		7.16***	
Nobs.	3464		3506	
Panel C: Routine Housework (HILDA)				
OLS	4.06	(0.38)***	-1.34	(0.22)***
FE	1.50	(0.53)***	-0.05	(0.27)
Chi2 test of equality of coefficients	16.75***		13.05***	
Nobs.	4316		4583	

Notes: Data comes from the 1992-2011 PSID, the 1991-2008 BHPS, and the 2002-2013 HILDA. Sample is women (men) between 24 and 65 years old, not living in the parental home, who have not been divorced, and who are observed in at least two waves. We consider singles (i.e. single individuals not living in the parental home), marrieds (i.e. individuals who are in a partnership, either legally married or cohabiting) and marrying (i.e. individuals who transition from single to married). Housework is reported in hours per week as the answer to the question "About how much time do you spend on housework in an average week? I mean time spent cooking, cleaning, and doing other work around the house?", in PSID, "About how many hours do you spend on housework in an average week, such as time spent cooking, cleaning and doing the laundry?", in BHPS, and "How much time would you spend on housework, such as preparing meals, washing dishes, cleaning house, washing clothes, ironing and sewing, in a typical week?" (variable lshw), in HILDA. The regressions of housework on a dummy for living with a partner (cohabiting or being married) also control for a quadratic on age, education at age 25 in years, an interaction term of age and years of education, a logarithm in the number of children, and number of household rooms. Standard errors in brackets. *** Significant at the 1 percent level; ** significant at the 5 percent level; * significant at the 10 percent level.

Table 6: Changes of housework upon marriage by type of Housework

	(1) Routine Housework		(2) Non-routine Housework	
	Coefficient	Standard Error	Coefficient	Standard Error
Panel A. Women				
OLS	4.06	(0.37)***	0.09	(0.20)
FE	1.50	(0.53)***	0.12	(0.22)
Chi2 test of equality of coefficients	16.75***		0.01	
Nobs.		4316		4316
Panel B. Men				
OLS	-1.34	(0.22)***	1.55	(0.21)***
FE	-0.05	(0.27)	1.59	(0.28)***
Chi2 test of equality of coefficients	13.05***		0.01	
Nobs.		4273		4273

Notes: Data comes from the 2002-2013 HILDA. Sample is women between 24 and 65 years old, not living in the parental home, who have not been divorced, and who are observed in at least two waves. We consider singles (i.e, single individuals not living in the parental home), marrieds (i.e, individuals who are in a partnership, either legally married or cohabiting) and marrying (i.e. individuals who transition from single to married). All housework variables are reported in hours per week and constitute the answer to the question “How much time would you spend on each of the following activities in a typical week?”. The activity for Column 2 is “Housework, such as preparing meals, washing dishes, cleaning house, washing clothes, ironing and sewing”. In Column 3 it is “Household errands, such as shopping, banking, paying bills, and keeping financial records (but do not include driving children to school and to other activities)”. In Column 5 it is “Outdoor tasks, including home maintenance (repairs, improvements, painting etc.), car maintenance or repairs and gardening”. Routine excluding Outdoor tasks in Column 4 adds up time devoted to Housework and Household errands, while Total Housework in Column 6 includes time devoted to Housework, Household errands and Outdoor tasks. The regressions of housework on a dummy for living with a partner (cohabiting or being married) also control for a quadratic on age, education at age 25 in years, an interaction term of age and years of education, a logarithm in the number of children, and number of household rooms. Standard errors in brackets. *** Significant at the 1 percent level; ** significant at the 5 percent level; * significant at the 10 percent level.

Appendix A: MTUS

Table A1 Survey design

Country	Year	Survey coverage	Diary days	Time interval	Mode of data collection	Number of activities	Original sample size
Austria	1992	Main collection in March and September 1992, some diaries from February, April through August, and October 1992	1-day	15 min.	Self- completion	202	25,233 diaries
Canada	1998	January - December 1998	1-day	Free	Recall by telephone	178	10,726 diaries
France	1998	January - December 1998	1-day	10 min.	Self- completion	139	15,441 diaries
Germany	2001	April 2001-March 2002	3-day	10 min.	Self- completion	271	35,813 diaries
Italy	2002	April 2002-March 2003	1-day	10 min.	Self- completion	96	55,773 diaries
Norway	2000-01	February 2000's - February 2001	2-day	10 min.	Self- completion	122	6,628 diaries
Spain	2002-03	October 2002-October 2003	1-day	10 min.	Self- completion	198	46,774 diaries
The United Kingdom	2000-01	June 2000's - August 2001	2-day	10 min.	Self- completion	265	20,980 diaries
The United States	2003-08	Whole years of 2003, 2004, 2005, 2006, 2007, and 2008	1-day	Free	Recall by telephone	564	85,177 diaries

We restrict the sample to individuals who had time diaries that added up to a complete day (i.e., 1440 min). All surveys include sample weights to ensure each day of the week and each survey are uniformly represented.

Source: Multinational Time Use Study (MTUS, www.timeuse.org) version 5.8 release 5 for Austria, France, Spain, UK, and US, and version 5.53 for Canada, Germany, Italy, and Norway..

Table A2 Coding of Housework Activities

Activity	MTUS activity code	Type	Definition
Cooking, washing up	AV6	Routine	Food preparation, baking, freezing foods, making jams, pickles, preserves, drying herbs, washing up, putting away dishes, making a cup of tea, coffee, etc., and setting the table
Household upkeep	AV7	Routine	Washing clothes, hanging washing out to dry, bringing it in, ironing clothes, making, changing beds, dusting, hovering, vacuum cleaning, general tidying, outdoor cleaning, other manual domestic work, housework elsewhere unspecified, and putting shopping away. It also includes all "sundry" or "other" house/domestic work variables
Odd jobs	AV8	Non-routine	Repair, upkeep of clothes, heat and water supply upkeep, DIY, decorating, household repairs, vehicle maintenance, car washing, etc., home paperwork (not computer), pet care, care of houseplants, (other) tasks in and around the home (unspecified), feeding and food preparation for dependent adults, washing, toilet needs of dependent adults, shopping for others, fetching/carrying for other, other care of adults, doing housework for someone else (unpaid), care of adults (unspecified), service for animals (eg animals to vet), fetching, picking up, dropping off, and home paperwork on computer, obtaining medical care for household adults and self administered medical care and medical care administered to (by respondent) other household adults, unpaid help to others (i.e. house cleaning; farm help; assistance in correspondence, transportation, etc).
Gardening	AV9	Non-routine	Gardening and any original variables which combine "gardening" and "animal care"
Shopping	AV10	Routine	Everyday shopping, shopping unspecified, shopping for durable goods, services for upkeep of possessions, money services, attending jumble sales, bazaars, etc., video rental or return, other service organizations or use (e.g. travel agent), and all activities where a "maintenance service" is used (i.e. filling up car at the gas station, taking clothes to the cleaners or laundry, etc). It also includes all activities labelled "other" or "uncodeable" services, and "errands" and "running errands".
Domestic travel	AV12	Routine	Accompanying adult or child (i.e to doctor), shopping/services (travel to/from), care of others (travel), posting a letter, and all travel related to household, care of children, shopping, personal services/care, etc.

Source: MTUS 1992-2008.

Table A3 Construction of Variables in MTUS

Variable	Variable definition	Derived from MTUS variable(s)
Housework	Average weekly hours of housework.	AV6, AV7, AV8, AV9, AV10, AV12
Routine housework	Average weekly hours of routine housework.	AV6, AV7, AV10, AV12
Non-routine housework	Average weekly hours of non-routine housework.	AV8, AV9
Married	Dummy variable equal to 1 if currently married or cohabiting , and 0 single, divorced or widowed	CIVSTAT, CPHOME
Not in parental home	Dummy variable equal to 1 if mother and father not in respondents household, and 0 otherwise	CPHOME
Age	Age at date of interview (years)	AGE
Primary	Dummy variable equal to 1 if education level of respondent (ISCED) is <3	EDTRY
Secondary	Dummy variable equal to 1 if education level of respondent (ISCED) is 3 or 4.	EDTRY
More than secondary	Dummy variable equal to 1 if education level of respondent (ISCED) is >4.	EDTRY
Number of children	Number of under 18 in the household	NCHILD
Paid work	Average weekly hours of paid work.	AV1, AV2, AV3, AV5

Source: MTUS 1992-2008.

Table A4 Summary statistics

	Housework	Married	Paid work	Edulevel1	Edulevel2	Edulevel3	No. Of children	Age	Observations
Women									
Austria	38.68 (0.22)	0.81 (0.00)	17.05 (0.31)	0.72 (0.00)	0.19 (0.01)	0.09 (0.00)	0.82 (0.01)	43.17 (0.12)	7888
Canada	28.05 (0.34)	0.76 (0.01)	25.87 (0.49)	0.19 (0.01)	0.22 (0.01)	0.59 (0.01)	0.88 (0.02)	42.68 (0.18)	3669
France	29.33 (0.28)	0.81 (0.01)	21.58 (0.40)	0.17 (0.01)	0.47 (0.01)	0.36 (0.01)	0.91 (0.02)	43.50 (0.15)	5007
Germany	30.03 (0.18)	0.75 (0.00)	17.80 (0.25)	0.12 (0.00)	0.62 (0.00)	0.26 (0.00)	0.81 (0.01)	44.92 (0.09)	12022
Italy	40.87 (0.17)	0.84 (0.00)	17.06 (0.24)	0.23 (0.00)	0.68 (0.00)	0.09 (0.00)	0.67 (0.01)	45.35 (0.09)	13515
Norway	25.95 (0.40)	0.81 (0.01)	22.63 (0.58)	0.14 (0.01)	0.53 (0.01)	0.33 (0.01)	1.05 (0.02)	43.22 (0.21)	2865
Spain	37.59 (0.17)	0.86 (0.00)	16.90 (0.24)	0.28 (0.00)	0.52 (0.00)	0.20 (0.00)	0.78 (0.01)	45.31 (0.09)	13074
UK	29.30 (0.25)	0.77 (0.01)	21.46 (0.36)	0.39 (0.00)	0.34 (0.01)	0.28 (0.01)	0.94 (0.01)	43.39 (0.13)	6251
US	26.74 (0.09)	0.63 (0.00)	26.53 (0.14)	0.09 (0.00)	0.26 (0.00)	0.65 (0.00)	1.07 (0.01)	44.01 (0.05)	47927
Men									
Austria	13.32 (0.22)	0.89 (0.00)	37.90 (0.44)	0.76 (0.00)	0.12 (0.01)	0.12 (0.01)	0.88 (0.01)	44.21 (0.13)	6510
Canada	17.01 (0.31)	0.79 (0.01)	41.35 (0.62)	0.20 (0.01)	0.20 (0.01)	0.60 (0.01)	0.85 (0.02)	42.58 (0.19)	3208
France	12.57 (0.26)	0.85 (0.01)	36.08 (0.52)	0.16 (0.01)	0.50 (0.01)	0.34 (0.01)	0.90 (0.02)	43.85 (0.16)	4540
Germany	17.68 (0.18)	0.88 (0.00)	33.84 (0.36)	0.06 (0.00)	0.47 (0.00)	0.46 (0.00)	0.80 (0.01)	46.62 (0.11)	9937
Italy	12.68 (0.16)	0.87 (0.00)	39.75 (0.32)	0.17 (0.00)	0.73 (0.00)	0.10 (0.00)	0.70 (0.01)	46.13 (0.10)	11996
Norway	18.45 (0.36)	0.82 (0.01)	36.79 (0.72)	0.11 (0.01)	0.52 (0.01)	0.37 (0.01)	0.98 (0.02)	43.02 (0.22)	2381
Spain	12.45 (0.17)	0.90 (0.00)	39.66 (0.34)	0.23 (0.00)	0.53 (0.00)	0.24 (0.00)	0.81 (0.01)	46.01 (0.10)	11100
UK	16.69 (0.24)	0.85 (0.01)	37.50 (0.47)	0.35 (0.00)	0.37 (0.01)	0.29 (0.01)	0.87 (0.01)	43.80 (0.14)	5199
US	17.59 (0.09)	0.70 (0.00)	39.62 (0.18)	0.09 (0.00)	0.27 (0.00)	0.64 (0.00)	0.98 (0.01)	43.91 (0.05)	37829

Source: MTUS 1992-2008.

Appendix B: PSID, BHPS, and HILDA

Table B.1. Comparison MTUS with PSID and BHPS

	MTUS-PSID				MTUS-BHPS			
	(1) MTUS	(2) MTUS	(3) PSID 2003-2007	(4) PSID 2003-2007	(1) MTUS	(2) MTUS	(3) BHPS year 2001	(4) BHPS year 2001
Panel A. Women								
Married	4.58*** (0.14)	3.14*** (0.13)	5.46*** (0.25)	3.85*** (0.24)	3.18*** (0.40)	2.81*** (0.35)	3.79*** (0.49)	2.85*** (0.45)
Age		0.53*** (0.05)		-0.04 (0.09)		0.86*** (0.12)		0.34*** (0.08)
Age^2		-0.01*** (0.00)		0.00* (0.00)		-0.01*** (0.00)		-0.00*** (0.00)
Number of Children		1.53*** (0.06)		2.60*** (0.14)		1.84*** (0.15)		2.79*** (0.25)
Hours of paid work		-0.17*** (0.00)		-0.15*** (0.01)		-0.20*** (0.01)		-0.15*** (0.01)
Constant	10.07*** (0.11)	0.51 (1.04)	11.56*** (0.21)	12.81*** (1.83)	15.87*** (0.35)	-1.90 (2.51)	13.10*** (0.42)	6.00*** (1.74)
R-squared	0.0236	0.197	0.0360	0.172	5,974	5,974	2,824	2,824
Observations	46,490	46,490	9,935	9,935	0.0106	0.241	0.0227	0.214
Panel B. Men								
Married	-0.46*** (0.11)	-0.58*** (0.12)	-1.02*** (0.22)	-1.29*** (0.23)	-1.76*** (0.33)	-1.50*** (0.32)	-2.14*** (0.38)	-2.15*** (0.40)
Age		0.28*** (0.04)		0.13** (0.06)		0.27*** (0.09)		-0.04 (0.04)
Age^2		-0.00*** (0.00)		-0.00* (0.00)		-0.00** (0.00)		0.00 (0.00)
Number of Children		0.46*** (0.05)		0.57*** (0.08)		0.34*** (0.11)		0.38** (0.16)
Hours of paid work		-0.08*** (0.00)		-0.06*** (0.01)		-0.09*** (0.00)		-0.07*** (0.01)
Constant	5.46*** (0.09)	2.41*** (0.85)	8.25*** (0.20)	7.11*** (1.26)	8.23*** (0.30)	3.92** (1.93)	7.43*** (0.36)	10.60*** (0.95)

R-squared	0.0005	0.0910	0.0025	0.0269	4,962	4,962	2,425	2,425
Observations	36,510	36,510	9,192	9,192	0.00584	0.151	0.0201	0.0875

Notes: Each column presents regression coefficients as in Table 1 and 2 in the text. As in the analysis presented in Tables 1 and 2 we restrict the sample to respondents between 24 and 65 years old, and exclude retired individuals and students in order to net out life-cycle effects that are closely related to time-use patterns. We also restrict the sample to individuals who are no longer living with their parents. The dependent variable is routine housework and is measured in hours per week. Routine housework is defined as the time spent in cooking and household upkeep in columns 1, 2, 5, and 6 (codes Av6 and av7 in MTUS). In columns 3, 4, 7 and 8 routine housework is the response to the question "About how many hours do you spend on housework in an average week, such as time spent cooking, cleaning and doing the laundry?". Specifications in columns 2, 4, 6, and 8 also include education dummies (secondary education, and post-secondary education or more, less than secondary education being the reference category). Source: MTUS (2000-2001, 2003-2007), BHPS (2001), and PSID (2003-2007).

Table B.2 Variable Definitions

Variable	Variable definition	Derived from variable(s)
Panel A. PSID		
Housework	Average weekly hours of housework.	HHOURS_HEAD HHOURS_WIFE
Married	Dummy variable equal to 1 if currently married or cohabiting , and 0 single, divorced or widowed	MARST
Always single	Dummy variable equal to 1 if single, divorced, or widowed during all waves , and 0 otherwise	MARST
Always married	Dummy variable equal to 1 if married during all waves , and 0 otherwise	MARST
Transition into marriage-single	Dummy variable equal to 1 for first transition into marriage from single, and 0 otherwise	MARST
Age	Age at date of interview (years)	AGE_HEAD AGE_WIFE
Years of education	Years of schooling	EDUCATION
Number of children	Number of under 18 in the household	NCHILD
Number of rooms	Number of rooms in the respondent's house	ROOMS
Panel B. BHPS		
Housework	Average weekly hours of housework.	HOWLNG
Married	Dummy variable equal to 1 if currently married or cohabiting , and 0 single, divorced or widowed	MASTAT
Not in parental home	Dummy variable equal to 1 if mother and father not in respondents household, and 0 otherwise	HGFNO, HGMNO
Always single	Dummy variable equal to 1 if single, divorced, or widowed during all waves , and 0 otherwise	MASTAT
Always married	Dummy variable equal to 1 if married during all waves , and 0 otherwise	MASTAT
Transition into marriage-single	Dummy variable equal to 1 for first transition into marriage from single, and 0 otherwise	MASTAT
Age	Age at date of interview (years)	AGE
Years of education	Years of schooling with the following translation: 18 for Higher Degree, 16 for First Degree, 15 for Further Education, 13 for A-levels, 11 for O-levels and other secondary education, 10 for other or no qualification.	QFEDHI
Number of children	Number of under 18 in the household	NKIDS
Number of rooms	Number of rooms in the respondent's house	HSROOM
Panel C. HILDA		
Housework	Average weekly hours of housework.	LSHW
Married	Dummy variable equal to 1 if currently married or cohabiting , and 0 single, divorced or widowed	MRCURR
Not in parental home	Dummy variable equal to 1 if mother and father not in respondents household, and 0 otherwise	HHMID HHFID
Always single	Dummy variable equal to 1 if single, divorced, or widowed during all waves , and 0 otherwise	MRCURR
Always married	Dummy variable equal to 1 if married during all waves , and 0 otherwise	MRCURR

Transition into marriage-single	Dummy variable equal to 1 for first transition into marriage from single, and 0 otherwise	MRCURR
Age	Age at date of interview (years)	HGAGE
Years of education	Years of schooling with the following translation: 18 for Postgrad - masters or doctorate, 17 for Grad diploma, grad certificate, 16 for Bachelor or honours, 14 for Adv diploma, diploma, 13 for Cert III or IV, 12 for Year 12, 11 for Year 11 or equivalent, 10 for Year 10 or equivalent / Junior Seco, 9 for Year 9 or equivalent, 8 for Year 8 or equivalent, 7 for Year 7 or equivalent (NSW, VIC, TAS), O-levels and other secondary education, 6 for Primary school.	EDHIGH EDHISTS
Number of children	Number of under 18 in the household	HGAGE
Number of rooms	Number of rooms in the respondent's house	HSBEDRM

Source: PSID (1992-2011), BHPS (1991-2008), and HILDA (2002-2013).

Table B.3. Summary Statistics

	Housework	Age	Years of education	If children under 5	If children	Number of children	Number of house rooms
Panel A: PSID							
Married or cohabiting	18.44 (0.08)	42.21 (0.07)	13.68 (0.01)	0.25 (0.00)	0.55 (0.00)	0.57 (0.00)	6.95 (0.01)
Single	8.82 (0.26)	36.29 (0.22)	13.93 (0.05)	0.11 (0.01)	0.24 (0.01)	0.24 (0.01)	4.37 (0.04)
N	26413	26413	26413	26413	26413	26413	26413
Panel B: BHPS							
Married or cohabiting	17.83 (0.06)	43.56 (0.06)	12.44 (0.01)	0.16 (0.00)	0.45 (0.00)	0.44 (0.00)	5.08 (0.01)
Single	10.28 (0.23)	39.16 (0.22)	13.43 (0.05)	0.07 (0.01)	0.18 (0.01)	0.17 (0.01)	3.71 (0.03)
N	34554	34554	34554	34554	34554	34554	34554
Panel C: HILDA							
Married or cohabiting	18.49 (0.07)	44.23 (0.06)	12.94 (0.02)	0.23 (0.00)	0.52 (0.00)	0.54 (0.00)	3.46 (0.01)
Single	10.52 (0.23)	40.10 (0.19)	13.43 (0.05)	0.10 (0.01)	0.23 (0.01)	0.22 (0.01)	2.56 (0.02)
N	33074	33074	33074	33074	33074	33074	33074

Source: PSID (1992-2011), BHPS (1991-2008), and HILDA (2002-2013).

Table B.4. Housework and marriage: Evidence from longitudinal data. PSID 1985-2011

	(1) Women		(2) Men	
	Coefficient	Standard Error	Coefficient	Standard Error
OLS	6.34	(0.41)***	-0.82	(0.26)***
FE	2.67	(0.52)***	0.35	(0.40)
Chi2 test of equality of coefficients	34.12***		7.85***	
N obs.	3895		4281	

Notes: Data comes from the 1985-2011 PSID. Sample is women (men) between 24 and 65 years old, not living in the parental home, who have not been divorced, and who are observed in at least two waves. We consider singles (i.e, single individuals not living in the parental home), marrieds (i.e, individuals who are in a partnership, either legally married or cohabiting) and marrying (i.e. individuals who transition from single to married). Housework is reported in hours per week as the answer to the question "About how much time do you spend on housework in an average week? I mean time spent cooking, cleaning, and doing other work around the house?". The regressions of housework on a dummy for living with a partner (cohabiting or being married) also control for a quadratic on age, education at age 25 in years, an interaction term of age and years of education, a logarithm in the number of children, and number of household rooms. Standard errors in brackets. *** Significant at the 1 percent level; ** significant at the 5 percent level; * significant at the 10 percent level.