Does Housework Lower Wages and Why? Evidence for Britain

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ABSTRACT

Women working full-time in the UK earn on average about 18% per hour less than men (EOC, 2005). Traditional labour economics has focussed on gender differences in human capital to explain the gender wage gap. Although differences in male and female human capital are recognized to derive from different household responsibilities over the life cycle, there is also a lesser-studied and more direct effect of household activities on wages. In a broad economic sense, household activities require effort, which decreases labour market productivity and thus wages. This paper first documents the relationship between housework and wages in Britain and applies a variety of econometric techniques to pin down the effect of housework on wages. It further explores what dimensions of housework are at the root of the relationship between housework and wages. After controlling for unobserved heterogeneity, we find a negative effect of housework on wages for married female workers, but not for single workers or married male workers. We argue that the factors behind the relationship between housework and wages are the type and timing of housework activities as much as the actual time devoted to housework.

NON-TECHNICAL SUMMARY

Although the gap between men and women's pay has been declining in recent years, full-time men still earn on average nearly 18% more than full-time women. To explain this gap and make policy recommendations, traditional economic analysis has concentrated on men and women's skills, qualifications and labour market experience, as well as the possibility of employer discrimination against women. Our focus in this paper is different: we investigate whether, in addition to labour market activities, domestic commitments may affect wages and, given the unequal distribution of housework between men and women, so contribute to the gender wage gap.

Housework may affect wages because it reduces the amount of energy and flexibility that can be brought to the labour market. Individuals who go to work tired after doing the housework are likely to perform less well than others with no housework commitments; similarly, having the responsibility of organising domestic activities may make it more difficult to concentrate at work. Furthermore, those who need to do housework at certain times (for example cooking meals) cannot be as flexible in their working hours as those with no commitments and so may be more restricted in the types of jobs they can do. To investigate the different mechanism by which housework affects wages, we analyse its effects separately for married and single people and for men and women, and we provide evidence about housework specialisation amongst married couples as compared to single men and women.

Comparing people with similar education and experience (and in similar jobs), we find that married people who do more housework earn lower wages. However, we do not find these associations among single people, suggesting that the division of housework upon marriage is important for its effects on wages. A large part of the wage-housework relationship can be explained by people's different life-cycle trajectories: more home-centred people tend to pick up fewer labour market skills and end up in lower paid jobs, while more career-oriented individuals earn more and also do less housework. Once we account for these long-term differences between people, the 'direct' effects of housework on wages are smaller and we find they are concentrated among married women.

To explore why housework affects married women's wages in particular, we analyse the types of housework performed by married couples and when these tasks are performed. As well as doing more total hours of housework than men (or single women), married women specialise in routine tasks (like cooking and laundry) which are done at times that may interfere with market work. In particular there is evidence that the married women's housework may limit their market work activities towards the end of the working day. Married men, by contrast, tend to specialise in housework tasks, like gardening and household repairs, that can be put off to the weekend.

Overall, we find that housework lowers wages but our results also suggest that the type and timing of different housework tasks is as important as the total time devoted to housework. In the short-term a redistribution of some key housework tasks from men to women within couples would likely lead to a modest reduction in the gender wage gap. But the longer term effect could be substantially larger if it changed women's orientation to the labour market and encouraged them to aim for higher qualified and better paid jobs.

1 Introduction

Women working full-time in the UK earn on average about 18% per hour less than men (EOC, 2005), and the difference increases to 25% when part-time women are included (Olsen and Walby, 2004). Although the gap has closed considerably since the introduction of the Equal Pay Act in 1970 (when the full-time gap was 37%,), convergence has slowed in recent years, with little change since the mid-1990s. To account for this gap, traditional labour economics has focussed on gender differences in skills, qualifications and job characteristics. An important explanation for women's lower wages in this framework is that women have greater household commitments, leading them to interrupt their careers more frequently than men and invest less in human capital (Mincer and Polachek, 1974). In this way, household commitments have an *indirect* impact on the gender wage gap through differential skills acquisition. By accounting for gender differences in skills it should then be possible to explain much of the gender wage gap. In practice, studies have found that a substantial wage differential remains even when it is possible to measure women's actual labour market experience (for example, Myck and Paull, 2001, and Olsen and Walby, 2004).

In this paper, we focus on a lesser-studied and more *direct* effect of household activities on wages. Becker (1985) first described a model in which a fixed amount of energy or effort has to be allocated amongst different activities. Tiring activities like housework reduce the amount of effort available for market work, resulting in lower productivity and wages.[1] Thus among workers with the same human capital characteristics and hours of labour market work, those with more housework commitments have lower wages. Since women devote more time to housework than men (about 6 hours a week more in the UK), the direct effect of housework may be an important explanatory factor behind the gender pay gap.

This paper first documents a negative effect of housework on wages in Britain using data from the British Household Panel Survey (1992-2004). Second, we explore which dimensions of housework (whether the actual housework time or the type and timing of housework activities) are the driving force for the negative effect of housework on wages.

[1] Effort in the market can be interpreted very broadly. As well as limiting the amount of physical and mental energy available for work, housework commitments may reduce workers' on-the-job flexibility, constrain networking opportunities and make it more difficult to commute to good jobs. For example Bonke et al. (2005) suggest that housework done just before or after market work has a larger wage penalty because workers are not always present when needed (for example, to attend late meetings).

Although the BHPS does not contain information on the type or timing of housework, we perform the analysis for married and single individuals to indirectly explore the channels that might be at the root of this negative relationship. Marriage is characterized by the presence of specialization and economies of scale that not only change the actual time devoted to housework, but also the type of housework activities (Hersh and Stratton, 2002).[2] Married individuals might also be constrained in the timing of housework (and other activities) because of the need to synchronize leisure activities with the spouse (Hamermesh, 2000 and Jenkins and Osberg, 2003). Thus, if housework has a different effect for single than for married individuals, this would suggest that the effect of housework on wages goes beyond the actual time devoted to housework, and might reflect these other dimensions of housework upon marriage. To investigate housework specialisation in more depth, we supplement our econometric analysis with data from the UK Time Use Survey 2000 (UK TUS).

After controlling for unobserved heterogeneity, we find a negative effect of housework on wages for married women of about 0.16% per hour of weekly housework. However, we find no effect for single women and little evidence of an effect for either married or single men. This differential effect across gender and marital status suggests that the factors behind the relationship between housework and wages are the type and timing of housework activities as much as the actual time devoted to housework. We find evidence from the UK TUS that compared to single women, married women specialise in routine housework which is done at times that may interfere with market work. Married men specialise to a lesser extent and their housework is not done on the margins of the working day.

Although few previous studies have explicitly considered married and single workers separately, our findings for married women are consistent with the negative effects of housework on women's wages generally found in US studies (Coverman, 1983, Shelton and Firestone, 1988, Hersch and Stratton, 1994, 1997, 2000, and 2002, Noonan, 2001, and Stratton, 2001). A similar relationship has been found in Denmark (Bonke et al., 2005).

[2] There is a well documented positive relationship between marriage and men's wages (see the survey in Ribar, 2004, and recent British evidence in Bardasi and Taylor, 2005). One possible explanation is that marriage increases specialisation within the household, with men concentrating on market work and women on domestic work. Although these studies often observe career interruptions and their associated wage effects, they do not normally have direct measures of time spent on household tasks. Thus, part of the effect that is being attributed to marriage could in fact reflect housework activities.

Those studies which have distinguished between married and single women find stronger effects for married women, as we do, although they still find significant negative effects among single women (for example Hersch and Stratton, 2002). There is no agreement in previous studies about the effect of housework on men's wages. On the basis of the above findings we conclude that the type and timing of housework activities are as important determinants of wages as the actual time devoted to housework, and that a woman's specialization in certain housework activities upon marrying, rather than a woman's increase in the time devoted to housework upon marriage, may be at the root of the negative effect of housework on the wages of married women.

The paper is organized as follows Section 2 describes the empirical specification, Section 3 describes the data used in the analysis and presents basic summary statistics. Section 4 presents the main results and Section 5 presents robustness checks and Section 6 concludes.

2 Empirical Specification and Empirical Strategy

Our analysis is based on the following standard wage equation augmented by measures of housework:

$w_{it} = x_{it}'\beta + \gamma h_{it} + \mu_i + \varepsilon_{it}$	(1)

where w_{it} is the log hourly wage of individual i measured at time t, x_{it} is a vector of characteristics assumed to affect wages and h_{it} is the number of hours of housework per week. The error term consists of an individual effect μ_i representing unmeasured characteristics that do not vary over time and a transitory component ε_{it}. The parameter of interest is γ, which is the marginal effect of housework on wages holding constant other relevant characteristics.

As mentioned in the introduction we are especially interested in the channels that might be at play behind the negative relationship between housework and wages. Thus, we perform the analysis by gender and marital status.

We first estimate descriptive regressions using ordinary least squares (OLS). We estimate two main specifications. In the first, x_{it} contains human capital variables (educational qualifications and a quadratic in experience) together with region and year dummy variables. The second specification adds controls for one-digit occupation and industry, public sector employment, establishment size, trade union coverage, and temporary and fixed-term employment. These additional variables are typically included in wage equations and several (such as occupation and industry) are known to play a role in accounting for the gender wage gap. Although these variables may be considered endogenous, we include them to see whether any effect of housework on wages is partly mediated through the type of job chosen.[3]

The OLS estimates will be biased if any of the variables in the right hand side are correlated with the error term. There are two main economic reasons, and also a statistical reason, for housework to be correlated with the error term. The first reason is permanent unobserved heterogeneity. Individuals with higher innate earnings capacity (captured by μ_i) may be more career-oriented and less home-centred than others, with the consequence that they earn more and also do less housework. In this case, μ_i will be negatively correlated with housework, and the estimate of γ will be negatively biased. We deal with this problem by estimating (1) as a fixed effects (FE) equation. The FE model controls explicitly for μ_i but still assumes that ε_{it} is uncorrelated with the explanatory variables.

The second reason for housework to be correlated with the error is that housework and wages may be simultaneously determined. This will operate through both μ_i and ε_{it}, but in the FE context only the correlation with ε_{it} is problematic. An individual who receives a higher than expected pay rise (high ε_{it}) may respond by outsourcing some of their own housework (by hiring a cleaner, for example). This negative correlation between the level of housework and ε_{it} will bias the estimate of γ in a negative direction.

The third reason for the error term to be correlated with housework is measurement error. Kan and Pudney (2007) compare different measures of housework time (time diary and

[3] Stratton (2001) suggests that individuals with greater household commitments may seek jobs with more flexible schedules, and that these jobs carry a wage penalty because they are more costly to employers. In a similar vein, Bonke et al. (2005) used job characteristics such as occupation and public sector affiliation as indirect measures of the level of flexibility required in housework activities.

'stylised' questions such as the one used here) and find substantial measurement error, especially in the stylised measures. Although their analysis is essentially cross-sectional, it seems likely that measurement error over time (affecting ε_{it}) is more severe. Hersch and Stratton (1997) suggest that a significant part of the observed variation in housework over time represents measurement error. Assuming that γ is negative (and that other variables are measured correctly), measurement error will induce a positive correlation between ε_{it} and measured housework and thus result in a positive bias.

Notice that the biases due to simultaneity and measurement error act in opposite directions. This may mean that simultaneity bias is largely offset by measurement error bias or even that measurement error dominates. Ultimately this is an empirical question which can (in principle) be answered using instrumental variables (IV) methods. Unfortunately, convincing instrument are difficult to find; however, to assess the likely importance of bias, we experiment with spousal characteristics as instruments in our FE equations (of necessity, this limits the IV analysis to married individuals).

3 Data and Sample

We use data from the BHPS, which has followed a nationally representative sample of about 5500 private households (containing about 10 000 individuals) since 1991. The survey aims to interview all adults (over 16 years old) from the original sample every year, as well as all other adult members of their current households (including newly formed households). Children in sample households become full sample members when they reach age 16. The BHPS contains rich information on household structure, socio-demographic characteristics, individuals' labour market experience and job characteristics. Since wave 2 it has asked respondents how long on average they spend on housework per week. Our sample comprises waves 2-14, corresponding to 1992 to 2004.

The BHPS has several advantages for our analysis. First, the data enable us to control for individuals' actual labour market experience and thus to account for any correlation of current housework with past experience (the indirect effect of housework). Second, we can control for time-invariant unobserved characteristics such as innate ability which may also be

associated with a predisposition towards market work and away from housework. Third, the BHPS also includes a rich set of job characteristics which have been found in previous studies to be important determinants of the gender wage gap, and may also proxy aspects of job flexibility that are linked to housework commitments (Bonke et al, 2005).

The main estimating sample is restricted to full time employees of working age (16-59 years for women and 16-64 years for men) who completed the full interview and gave valid information on all variables of interest. Our final sample contains 2574 men (observed over 7.0 waves on average) and 2191 women (5.5 waves). The housework variable 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?". The hourly wage is derived from respondents' usual gross pay per month and their usual weekly working hours, and is indexed to 2004 prices.[4]

The variable measuring labour market experience is derived from the BHPS employment status and job history files. In waves 2 and 3, respondents were asked to recall their employment history since first leaving full-time education, and at each subsequent interview they report employment changes since the previous interview. From this information we are able to construct a measure of actual experience (total time spent in employment, including self-employment).[5] By using actual, rather than potential, experience we allow for the effects of past career interruptions (including interruptions during the sample period). This could be particularly important if career interruptions in the past are associated with higher levels of current housework. Because the experience variable requires the complete labour market history of each individual, it is necessary to drop about 30% of individuals with incomplete histories. To check whether the results are affected by this selection, we re-estimate all equations using the full sample (and using age instead of experience). The results are discussed in section 5. Definitions of the remaining variables are given in Appendix Table A1.

[4] The wage is calculated as hourly wage = (usual gross pay per month) / [(usual standard weekly hours) + 1.5*(usual paid overtime weekly hours)] *(12/52). Wages are indexed to 2004 levels using the CHAWRPI non-seasonally adjusted retail price index from the Office for National Statistics

[5] See Maré (2006) for a discussion of the issues involved.

We base our main estimates on a sample of full time workers because including part time workers in our regressions would potentially lead to upward biased estimates of the housework coefficient. It is known that part time workers have a lower average wage than comparable full time workers, possibly because there are fewer hours in which to recover the fixed costs of employment. At the same time, our data confirm that part time market work is associated with substantially higher levels of housework. Alternatively we could include all workers and control for the number of hours (or part-time status) in the regression. We do not take this approach in our main analysis given that hours worked are endogenous. To check whether the results are robust to including all workers, in section 4 we repeat the analysis with the full sample and with a control for part-time status.

3.1 Summary Statistics

Table 1 presents summary statistics about housework and hourly wages for the main sample of full-time workers, broken down by gender and marital status. The means of the remaining variables used in the analysis are reported in Appendix Table A2.

Columns 1 and 2 in Table 1 show that there are considerable differences between men and women, especially among married individuals. Women undertake about 11 hours of housework per week whereas men do about 5 hours.[6] Columns 3-6 in Table 1 shows that much of the variation across gender is due to differences in housework among married men and women. Married women do about 2.5 times more housework than married men, devoting 12 hours to housework per week. By contrast, the differences between single men and women are much less pronounced. Single women do about 1.5 times more housework than men, devoting 7 hours to housework per week compared to about 4.5 hours for single men.[7]

[6] Although stylized questions of the type used in the BHPS are believed to be less accurate than measures of time derived from time use diaries (Juster, 1986), these figures are very similar to those obtained from UK Time Use Survey, which uses diary budget to account for a 24-hour period. In a similar sample of full-time workers, women report devoting on average 11.51 and men 6.50 hours to housework per week. Limitations in the wages data in the UK TUS discourage us from further using this survey beyond a mere descriptive tool of time use patterns.

[7] Differences in housework persist after unobserved individual heterogeneity is taken into account. Using data on individuals who get married during the panel, we find that women increase their weekly housework by 3.7 hours when they get married. Men on the other hand only increase their housework by 1.3 hours per week.

Variations in wages mirror those in housework for married workers, with married men earning over 20% more than married women on average. However, even though single women do more housework than single men, the difference in wages between single men and women is negligible. Although we cannot make any causal statement based on these raw figures the fact that a relationship between housework and wages is found for married but not single workers already suggests that the timing and type of housework activities might affect wages as much as the time devoted to housework. In Section 4, we therefore turn to multivariate analysis, first adding controls for observed heterogeneity (OLS), and then also controlling for individual-specific heterogeneity (FE model).

4 Main Results

4.1 Relationship between housework and wages: OLS estimates

Table 2 presents the OLS results for women and men, separately for married and single individuals.[8] To clarify the exposition all the tables in the paper report only the coefficients associated with housework, experience and education (full results available on request). The dependent variable is the log of the real gross hourly wage. For each sample we estimate two specifications. The first specification is a standard human capital equation containing a quadratic term in experience and dummy variables for educational qualifications, region and year. The second specification extends the basic human capital equation to include dummy variables for one-digit occupation and industry, public sector employment, establishment size, trade union coverage, and temporary and fixed-term employment.

As expected, the experience profile has an inverted-U shape in all the models, peaking at around 30 years. The return to experience, evaluated at 10 years, is approximately 3% per year. Education is strongly associated with higher wages: in the basic wage equation, a worker with a degree earns more than twice as much as an unqualified worker (for example, for married women, column (3), the marginal effect is exp(0.83)–1=1.29). Unsurprisingly, the

[8] We define married as being married or cohabiting in the current period, thus individuals switch between the married and single samples when they change status (about 20% change status at some point in the panel). Chow tests reject equal coefficients across marital status in all the specifications estimated. We also estimated pooled equations of married and singles where all the controls are interacted with marital status. The pooled specification takes into account the change within individuals in total housework time when moving from being single to being married. Results are robust to this specification and are available upon request.

returns to experience and education are somewhat lower after controlling for variables like occupation and industry in the extended specification (columns (5)-(8)).

Housework has a statistically significant and negative association with wages for married workers but no significant effect for single workers. In the basic wage equation for married workers (columns (3) and (4)), we observe that a one hour increase in housework per week is associated with a reduction of 1.1% in women's wages and a 0.9% reduction in men's wages. The magnitude of the effect of housework on wages is reduced for both married men and women once job characteristics are controlled for: the effects are about 0.7% for both sexes (columns (7) and (8)). This reduction in the housework coefficients suggests that part of the negative relationship between housework and wages can be attributed to the type of job held. Nevertheless, there remains a substantial effect even after controlling for job characteristics.

Given the significant difference in housework between men and women, and our findings that housework has a negative effect on married men and women's wages, including housework in wage regressions should yield a greater explanatory power of the gender wage gap. Here we employ the standard Oaxaca (1973) decomposition to disentangle what proportion of the gender gap in log wages is due to differences in observable characteristics and what proportion is due to differences in the returns of those observables. The equations are estimated using pooled samples of married and single workers with interactions of housework and marital status.

In our sample the mean gender gap in log wages is 16.7 log points (corresponding to 15.4% of mean men's wages). We decompose this difference by valuing observable characteristics at the rates estimated for women, at the rates estimated for men, and at the rates estimated for a pooled sample of men and women. Table 3 shows that in all specifications used, the percentage of the gender gap that can be explained is substantially greater when including housework in the wage equation. Column 1 in Table 3 shows that when using the coefficients from the women's sample the percentage explained increases by 17 percentage points, from 19.2% when housework is excluded from the wage equation, to 35.9%. Column 2 in Table 3 shows that when using the coefficients from the men's sample

the percentage explained increases by 27 percentage points, and similarly when using the coefficients from the pooled regression.

4.2 Fixed Effects results

The OLS estimates in Table 2 do not control for permanent unobserved heterogeneity which might be associated with both wages and housework. If the permanent error in Equation (1) is correlated with housework, then the OLS coefficients will be biased. For example, more career-oriented individuals are likely to earn more (have a high individual effect in the wage equation) and also do less housework. Unobserved individual effects may bias the coefficients and also drive the difference between married and single individuals (if heterogeneity systematically differs across marital status). To allow for permanent unobserved heterogeneity, we present results from FE models.

Table 4 shows results from the same specifications as in Table 2, but estimated as FE models that control for permanent individual heterogeneity.[9] The first row shows that as before, housework has no effect on wages for single individuals. In the second row, columns (1) and (2) (the basic wage equation) show that for married workers the effect of housework on wages is considerably smaller than in the OLS specification. An extra hour of housework reduces a woman's wage by 0.16% (versus 1.1% before). For men the effect is 0.14% (versus 0.9% before) but the coefficient is only marginally significant. The last two columns in Table 4 show that the magnitude of these coefficients declines only slightly when job characteristics are controlled for (unlike the substantial decline in the OLS results). This finding indicates that the individual effects are capturing the relevant aspects of the decision that leads workers with different housework commitments to select into different types of job.

The FE results confirm the pattern in the previous OLS estimates of no effect of housework on the wages of single individuals and a negative effect on married women's wages. However, unlike in the OLS results, the evidence is much weaker for married men. The FE coefficient is negative, but it is imprecisely estimated and is not significantly

different from the coefficient for single men (t=0.34). By contrast, there is a significant difference between married and single women, t=2.45.

Given the imprecision of the estimates, clear cut conclusions about the overall pattern of differences are difficult to make. But there appears to be stronger evidence in favour of an effect among married women than among married or single men. It is possible that the wide confidence intervals around the coefficients for men simply reflect low variation in housework over time.[10] One might argue that with enough variation in the data (for example if a group of men increased their housework to women's levels over the sample period) we would detect a significant effect. Ultimately, though, we can only make inferences based on the available data and so our conclusion is that there is little evidence of a housework effect among married men. Our results are in fact similar to those found for the US by Hersch and Stratton (1997). Their FE estimates for a sample of full time married workers in the PSID show that an extra hour of housework reduces a woman's wage by 0.17% but has no effect on men's wages (zero to two decimal places).

4.3 Dimensions of housework and effects on wages: Time versus type and timing of activities

Table 4 shows that the effect of housework on wages differs for single and married workers. We find no (statistically) significant effect of housework on the wages for single workers, and the significance of the coefficient for married men is not very high. As noted, we cannot reject the hypothesis that the housework coefficient is the same for single men and married men. All in all, the estimates in Table 4 show that, although we find a reliable and negative effect of housework for married women, we cannot be sure that there is a negative effect of housework for the rest of the groups (single men and women and married men). What can explain this apparent differential effect of housework across marital statuses and gender? This section addresses this question by exploring whether there is any difference between housework performed by married and single workers and whether the difference of

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[9] The alternative RE model is not appropriate in this case since we specifically wish to allow for an association between the individual effects and housework. In all our wage specifications, a Hausman test of RE against FE rejects the zero correlation assumption.

[10] A variance decomposition of the housework variable (not reported) shows that the within-person variance of housework for married men is less than half that of married women (within variance accounts for 35-45% of overall variance).

housework across marital status changes by gender. In order to do this we explore two dimensions of housework specialization within marriage: The actual time devoted to housework on the one hand, and the type and timing of housework activities on the other hand.

Amount of housework

The first possible explanation to the fact that housework time has a negative effect on the wages of married women but not on the wages of single individuals or married men might be that married women do more housework. As evidence from the BHPS previously showed, women substantially increase the amount of housework when they get married. This explanation would in principle be consistent with the fact that there is a negative effect of housework for married women but not for the rest of the groups as long as housework is subject to threshold effects. We first test for threshold effects of housework in our BHPS sample. We reject specifications that include non-linear functions of housework. Table 5 shows that a squared term in housework is not statistically significant. Similar results are obtained when using a spline in housework with nodes at 5 and 10 hours (approximately the mean housework levels for men and women). Although for married individuals the coefficients in the middle range (5-10 hours) are higher than the other ranges, the three slope coefficients do not differ significantly from one another. So housework seems to have a similar effect at all levels.

We further explore the alternative explanation regarding the type and timing of housework activities being different for married women than the rest of the groups. It might be that a woman's specialization in different housework activities upon marrying imposes a greater constraint on paid work. Hersh and Stratton (2002) find that married women do indeed specialize in more routine activities (such as laundry and cleaning). This pattern of specialization may reduce on-the-job effort, either because this type of activities may bring about a greater physical or mental effort or because they might impose extra constraints on the timing of paid work. These different mechanisms are difficult to disentangle as it is not possible to assess to what extent different housework activities are tiring. However we can provide some evidence of whether married women specialize in more routine activities, and also on the timing of those housework activities and how that relates to the timing of work.

Unfortunately there is no information on the type or the timing of housework activities in the BHPS data, so we use a cross-section of full-time workers from the UK Time Use Survey 2000 (UK TUS) to explore the type and the timing of housework activities.

Type of housework

Table 6 shows the type of housework activities as defined in the UK TUS. Whereas married women specialize in more routine and time intensive activities, such as household upkeep, food, laundry, and shopping, married men specialize in gardening, household management and repairs. This pattern of household specialization is consistent with what studies have found in other countries (e.g., see Hersh and Stratton 2002 for the case of the US and Fernandez and Sevilla-Sanz, 2006 for the case of Spain). The lack of threshold effects suggests that it is not the fact these activities are more time-intensive which is behind the negative effect of housework on wages for married women. Instead, it is more likely that that these activities are associated with lower wages because they need to be done routinely, usually during work-days, and cannot be postponed until the weekend. Thus, these types of routine activities are more likely to interfere with the paid job and reduce job effort, either because they are more tiring in terms of physical or mental effort, or because they impose further constraints on when married women can be on the job.

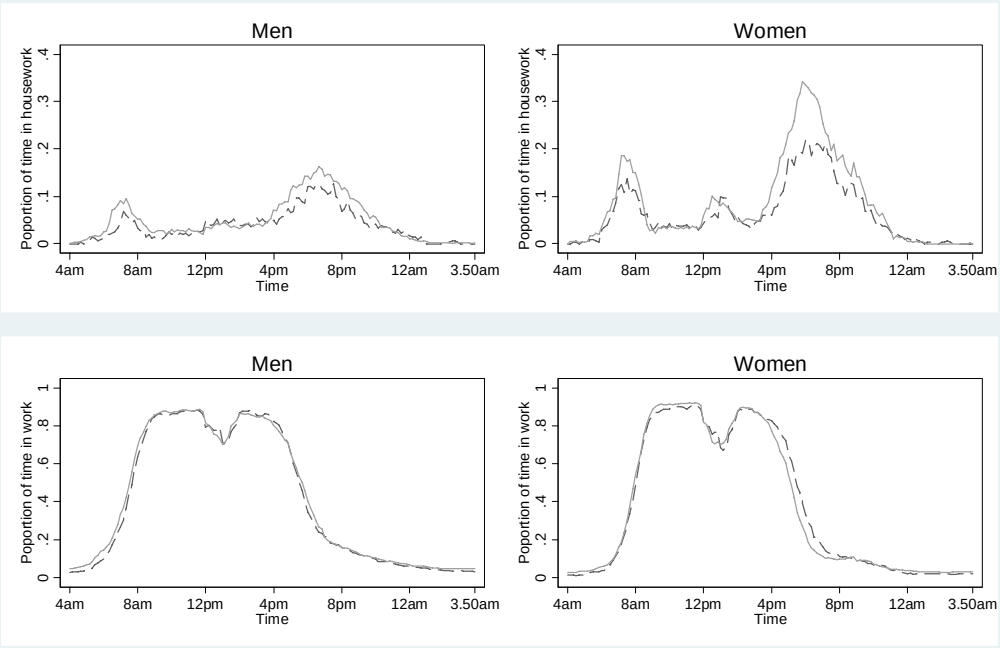
Timing of housework

The data do not allow us to see to what extent these activities are more tiring than say, less time intensive but more sporadic activities such as repairs. However, we can further explore whether these routine activities impose any timing constraints on paid work by looking at the timing of housework and market work. Unfortunately the BHPS offers no information on the timing of housework activities as it only asks a stylized question about the total amount of housework per week. As before, we use a similar sample of full-time workers from the UKTUS to explore how the timing of housework differs across marital status and gender. Table 7 shows the amount of housework that is done before and after work by sex and marital status. Both married men and women do about 5 minutes more of housework before work than single men and women. However, married women do about 16 minutes more housework than single women (94 minutes as opposed to 68) whereas married men do

just 10 more minutes of housework than single men (52 minutes vs. 42 minutes). This six minute difference between housework by married women and married men after work does not seem very big and, at first glance, it would not suggest that the timing of housework is constraining the timing of work. Figure 1 shows however a striking picture. It displays the proportions of time devoted to housework and paid work calculated over successive ten-minute slots. Whereas both married men and women seem to do more housework in the times before 10am and between 4pm and 8pm than their single counterparts, it seems that the timing of housework does not affect the timing of market work for married men. The lower graphs show that both single and married men do work at the same times. However, married women seem to do significantly less work than single women from 4pm till 8pm. In fact, married and single men both devote about 44% of their time to work during 4pm and 8pm. Single men do about 9% of housework, and married men 12%. However, whereas single women devote 40% of their time to work during this time (and 16% to housework), married women only devote 32% of their time to work (and 24% to housework).

Differences are similar if only the period between 4pm and 6pm is considered. Whereas single workers, and married men devote about 67% of the time to paid work, married women only devote about 56% of their time, a ten percentage point difference. During this time, single men devote 7% to housework, followed by married men with 10% and single women with 13%. Married women almost double the time devoted to housework during 4pm and 6pm with respect to the other groups. In fact married women devote 21% of their time to housework during 4pm and 6pm.

Figure 1 Distribution of Housework and Work Time during the Day



Source: Author's calculations from the UK TUS

--- single workers ____ married workers

In conclusion, it seems that a woman's specialization in certain housework activities upon marrying, rather than a woman's increase in the time devoted to housework upon marriage, may be at the root of the negative effect of housework on the wages of married women. In short, the time devoted to housework appears to matter but only for specific tasks. Although we cannot rule out that these activities are more tiring, and thus reduce on-the-job effort to a greater extent, we have provided some evidence that the timing of housework seems to be related to the timing of work for married women. Thus constraints on the timing of housework and work for married women may be at the root of the negative effect of housework on wages for this group.

5 Further Discussion and Robustness Checks

5.1 Addressing simultaneity and measurement error issues

While the FE model controls for permanent unobserved heterogeneity, it does not allow for any correlation between housework and the transitory error, ε_{it}. As already discussed, under plausible assumptions there are two opposing effects. On the one hand simultaneous determination of housework and wages will lead to a negative correlation of h_{it}

and ε_{it} (for example if individuals whose wages increase substitute own housework for market services). On the other hand if the true housework effect is negative, a simple model of measurement error in housework implies a positive correlation between measured housework and ε_{it}. Thus the net effect is ambiguous; in practice it may not be large. Hersch and Stratton (1997, 2002) conclude that housework is exogenous. To investigate the net effect of these two sources of bias in our data we experiment with fixed effect IV methods. Although it is difficult to suggest valid instruments for housework, we proceed using a set of spousal and household characteristics (spouse's participation, hours of work, occupation and wage, and the total number of employed household members).[11] The identifying assumption is that changes in the labour market behaviour of the spouse and other household members affect an individual's own housework but are unrelated to any shock to their own wages. The estimates are necessarily restricted to the married samples but these are our focus of interest.[12]

The results shown in Table 8 are mixed. The instruments only appear valid in the equation for married men (in particular they fail the Sargan overidentification test in the married women's equation). The housework coefficient in the married men's equation is large, negative and statistically significant (–0.025 compared to –0.0014 in the FE equation). The fact that FE IV result is more negative than the FE coefficient would suggest that measurement error dominates simultaneity. Thus FE could be seen as a lower bound (in magnitude) on the true effect. However, a joint Hausman test of FE IV against FE does not reject exogeneity, implying that the FE specification is valid. Overall FE remains our preferred specification, with the caveat that it may understate the true negative effect of housework.

[11] We also experimented with OLS specifications using the same instruments, additional indicators of spouse's attitudes toward domestic roles, and a time-invariant instrument, mother's work status when the respondent was 14. OLS (or RE) IV is more efficient than FE IV if suitable instruments can be found. However, tests of overidentifying restrictions indicated that the instruments were correlated with the permanent error term in all the specifications tried.

[12] We also explored the use of previous lags of housework as instruments for current housework (in first differences) in a panel GMM framework. This strategy requires previous levels of housework to be strong predictors of current changes in housework (and to be unrelated to the differenced error term). There are not obvious theoretical reasons why this should be so; perhaps unsurprisingly, we could not obtain stable estimates using this approach (when trying different lag lengths for example).

5.2 Alternative housework measure

A measurement issue which potentially exacerbates endogeneity problems is that the housework question (which refers to an average week, implicitly close to the interview date) may pick up housework changes which occurred after the wage changed. Whether this happens will depend on the timing of wage setting (not observed in the data); for example if wages are only adjusted annually, the measured wage may refer to a level that was set several months before the interview. To examine the sensitivity of the results to this issue, we re-estimate the basic FE model using the first lag of housework. If pay setting is at least annual then, by this measure, housework always changes before the wage is adjusted.[13] As is shown in Table 9, we find a negative effect of housework on wages for married women which is almost identical to the main FE model (Table 4), while there is no evidence of effects among the other subgroups. These results support our conclusions that housework reduces married women's wages while having little effect on single women and married or single men.

5.2 Effects of children

We now investigate whether the housework effect for married women is due to the presence of children. As can be seen in Table 10, the BHPS data show that married women with children do over 3 hours more housework than those without children. It is also known that mothers earn less than non-mothers (see for example Waldfogel, 1998), so it is possible that the impact attributed to housework may in fact be an indirect effect working through childcare.[14] Table 11 reports specifications including controls for children (top panel) and also testing for interaction effects between children and housework (second panel). As expected, children are associated with lower wages for married women (4% per child) and higher wages for men (2% per child). But the housework coefficients in the top panel are very similar to those in the main FE specification (Table 4). When adding an interaction between housework and the number of children (second panel), we see that the main effects are somewhat smaller and only significant at the 20% level. However, the interaction terms are completely insignificant. Overall there is no evidence that the housework effect operates through the presence of children.

[13] We find no effect from second or higher lags of housework.
[14] The housework question does not mention childcare, nevertheless it is possible that respondents include some childcare in their housework reports.

5.3 Other robustness checks

The third panel of Table 11 shows that we obtain similar results when using age instead of actual experience as a human capital measure (this boosts the sample sizes by 35-40% since we do not need to observe full work histories). The effect for married women is –0.16% and highly significant (t=3.53), while there is no effect for single women. The effect for married men is now insignificant at the 5% level, but the coefficient for single men is marginally significant. Again, however, there is no significant difference between these two coefficients.

The final panel of Table 11 adds part-time workers to the sample, and includes a dummy variable to control for any direct effect of part-time status. Part-time status is defined as usual weekly hours of 30 or less. We also restrict the sample to those working more than 5 hours per week to alleviate problems of extreme measurement error (under-reporting of hours will produce spurious transitions into part-time work and inflate the hourly wage).[15] Given our previous discussion about the differences between full-time and part-time workers, we expect the effects to be at least as large as in the full-time sample. This is broadly what we find especially for married men. As mentioned, our preferred estimates are from the more homogeneous sample of full-time workers only.

6. Conclusion

This paper has looked at the effect of housework on wages. Our estimates provide strong evidence of differential impacts of housework across marital status for women. There is little evidence of any effect, and no differential impact, for men. Consistent with Hersh and Stratton (2002) for the US, our results suggests that the extra specialization in household activities and the additional synchronization needs with the spouse upon marriage might make housework within marriage specific. We thus conclude that the type and timing of housework might be as important as the actual time devoted to housework when explaining the negative relationship between housework and wages, and that the negative relationship between housework and wages is beyond the actual time and effort involved in housework.

Our results suggest that when designing effective policy to close the gender pay gap it is clearly important to have a better understanding of what determines men and women's pay in addition to conventional labour market characteristics. We have shown that including housework in a standard wage equation increases the unexplained difference between men and women wages by 27 percentage points. Given that women spend about 6 hours more of housework per week than men, looking at how households allocate their time to unpaid labour and leisure might provide the clue needed to accomplish this goal. Policies aiming at the compatibility of work and childcare have traditionally focussed on the provision of market or state services to substitute for women's unpaid labour. However, encouraging paternal childcare and men's housework activities, such as entitlement to paternity leave, might prove an effective alternative. By advancing our understanding of the causes of women's lower pay, the results will be directly relevant to the formulation of family friendly policies.

[15] The positive coefficients associated with part-time work in 3 of the sub-samples perhaps indicate that there remain issues of measurement error.

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Table 1: Summary Statistics for Housework and Wages

Variable	Women (1)	Men (2)	Single women (3)	Single men (4)	Married women (5)	Married men (6)
Log wage	2.040 (0.532)	2.207 (0.555)	1.939 (0.559)	1.941 (0.558)	2.094 (0.510)	2.309 (0.519)
Housework (hours per week)	10.638 (7.856)	4.659 (4.576)	7.125 (6.685)	4.382 (4.633)	12.507 (7.793)	4.764 (4.550)
Observations	12123	18030	4209	4979	7914	13051
Individuals	2191	2574	1115	1179	1585	1903

Note: Standard deviations in parentheses.

Table 2: The Association of Housework with Wages (OLS results)

Variable	Basic wage equation				Extended wage equation			
	Single women	Single men	Married women	Married men	Single women	Single men	Married women	Married men
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Housework (hours/wk)	-0.0017	0.0036*	-0.0108***	-0.0091***	-0.0007	0.0015	-0.0074***	-0.0066***
	(-0.82)	(1.79)	(-8.81)	(-5.25)	(-0.48)	(0.85)	(-7.66)	(-4.97)
Experience (years)	0.0512***	0.0561***	0.0447***	0.0456***	0.0393***	0.0446***	0.0304***	0.0318***
	(12.82)	(18.99)	(12.13)	(14.81)	(12.88)	(16.73)	(9.80)	(12.33)
Experience squared	-0.0009***	-0.0010***	-0.0008***	-0.0008***	-0.0007***	-0.0008***	-0.0006***	-0.0006***
	(-7.65)	(-14.18)	(-9.27)	(-13.03)	(-8.24)	(-13.17)	(-8.07)	(-11.48)
Degree	0.9237***	0.7312***	0.8320***	0.8194***	0.4765***	0.4156***	0.3524***	0.4061***
	(12.14)	(13.90)	(20.27)	(21.66)	(6.90)	(8.27)	(8.27)	(11.13)
Further education	0.4958***	0.3551***	0.4435***	0.4109***	0.2685***	0.2245***	0.1964***	0.1852***
	(6.62)	(7.54)	(12.00)	(13.22)	(4.43)	(5.51)	(6.16)	(7.34)
A-level	0.3568***	0.2855***	0.2949***	0.3584***	0.2101***	0.1882***	0.1125***	0.1778***
	(4.78)	(5.92)	(6.62)	(9.43)	(3.44)	(4.58)	(3.09)	(6.09)
O-level or equivalent	0.3057***	0.1644***	0.2047***	0.2079***	0.1632***	0.0928**	0.0692**	0.1081***
	(4.30)	(3.58)	(5.84)	(6.48)	(2.83)	(2.26)	(2.42)	(4.21)
Other qualifications	0.2343***	0.0672	0.1275***	0.1462***	0.1293**	0.0502	0.0394	0.0768***
	(2.92)	(1.33)	(3.12)	(4.01)	(2.08)	(1.09)	(1.10)	(2.61)
N	4209	4979	7914	13051	4209	4979	7914	13051
R^2	0.41	0.45	0.36	0.30	0.60	0.56	0.53	0.50

Notes: (i) All models include dummy variables for region and year; the extended specification also includes dummy variables for one-digit occupation and industry, public sector employment, establishment size, trade union coverage, and temporary and fixed-term employment; (ii) the dependent variable is the log of the real gross hourly wage; (iii) housework is in hours per week; (iv) *t*-statistics in parentheses (adjusted for clustering within individuals); (v) * significant at 10%; ** significant at 5%; *** significant at 1%

Table 3: Percentage of Gender Wage Gap Explained by Characteristics (OLS estimates)

	Coefficients from Women's Equation	Coefficients from Men's Equation	Coefficients from Pooled Equation
	(1)	(2)	(3)
Excluding housework	19.2	-15.0	30.5
Including housework	35.9	12.0	55.7

Table 4: The Effect of Housework on Wages (FE model)

	Basic wage equation		Extended wage equation	
	Women	Men	Women	Men
	(1)	(2)	(3)	(4)
Single	0.0011	-0.0019	0.0012	-0.0019
	(1.11)	(-1.42)	(1.28)	(-1.41)
Married	-0.0016***	-0.0014**	-0.0014***	-0.0013**
	(-3.12)	(-2.03)	(-2.73)	(-2.04)

Notes: (i) All models include a quadratic in experience and dummy variables for educational qualifications, region and year; the extended specification also includes dummy variables for one-digit occupation and industry, public sector employment, establishment size, trade union coverage, and temporary and fixed-term employment; (ii) the dependent variable is the log of the real gross hourly wage; (iii) housework is in hours per week; (iv) *t*-statistics in parentheses; (v) * significant at 10%; ** significant at 5%; *** significant at 1%

Table 5: The Effect of Housework on Wages: Non-linear Function of Housework (FE model)

	Single women	Single men	Married women	Married men
	(1)	(2)	(3)	(4)
Quadratic function				
Housework	0.0019	-0.0002	-0.0033***	-0.0014
	(1.23)	(-0.08)	(-2.66)	(-1.19)
Housework squared / 100	-0.0020	-0.0085	0.0045	0.0000
	(-0.68)	(-0.75)	(1.48)	(0.01)
Spline				
Housework 0-5 hours	0.0064	0.0027	0.0011	0.0012
	(1.54)	(0.75)	(0.22)	(0.62)
Housework 5-10 hours	0.0006	-0.0024	-0.0049*	-0.0033
	(0.19)	(-0.67)	(-2.48)	(-1.90)
Housework >10 hours	0.0004	-0.0046	-0.0011	-0.0012
	(0.31)	(-1.73)	(-1.76)	(-1.00)
Equality of coeffs, *p*-value	0.36	0.25	0.22	0.33

Notes: (i) All models include a quadratic in experience and dummy variables for educational qualifications, region and year; (ii) the dependent variable is the log of the real gross hourly wage; (iii) housework is in hours per week; (iv) *t*-statistics in parentheses; (v) * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 6: Specialization in Housework Activities by Marital Status and Gender

	Food	Upkeep	Laundry	Garden	Repairs	Shopping	Manage-ment	Child care
				Men				
Married	20.906	9.629	1.397	10.109	9.159	7.882	1.354	15.142
	(23.72)	(12.91)	(5.32)	(11.19)	(7.27)	(10.75)	(5.45)	(14.44)
Single	22.169	5.492	2.203	6.305	2	8.78	0.814	1.186
	(14.27)	(4.18)	(4.76)	(3.96)	(0.90)	(6.80)	(1.86)	(0.64)
Observations	1,211	1,211	1,211	1,211	1,211	1,211	1,211	1,211
				Women				
Married	43.748	22.466	14.252	9.864	1.515	15.981	1.01	15.01
	(29.35)	(17.15)	(13.13)	(9.29)	(2.41)	(13.13)	(3.86)	(11.48)
Single	30.41	14.59	6.53	9.291	2.388	13.022	1.082	4.44
	(14.72)	(8.04)	(4.34)	(6.31)	(2.74)	(7.72)	(2.99)	(2.45)
Observations	783	783	783	783	783	783	783	783

Notes: (i) Standard deviations in parentheses; (ii) Sample is full time workers between 15 and 65 for men and between 15 and 60 for women; (iii) Diary information is taken from week-days; housework reported in minutes. Source: UK TUS.

Table 7: Timing of Work and Housework

	Housework Before Work	**Housework After Work**
	Men	
Married	17.87	52.005
	(14.60)	(28.03)
Single	12.356	41.671
	(5.56)	(12.38)
Observations	1,567	1,567
	Women	
Married	28.555	93.777
	(14.08)	(31.67)
Single	23.248	67.977
	(8.70)	(17.43)
Observations	960	960

Notes: (i) Standard deviations in parentheses; (ii) Sample is full time workers between 15 and 65 for men and between 15 and 60 for women; (iii) Only those individuals with diaries during the week-day and "normal" days; housework reported in minutes. Source: UK TUS.

Table 8: Instrumental Variables Results (FE model)

	Basic wage equation		Extended wage equation	
	Women	Men	Women	Men
	(1)	(2)	(3)	(4)
Housework coefficient	0.0098*	-0.0253***	0.0106*	-0.0230***
	(1.74)	(-3.72)	(1.90)	(-3.42)
Observations	6808	12378	6808	12378
Individuals	1396	1845	1396	1845
First-stage partial R^2	0.011	0.018	0.011	0.012
First-stage F-statistic [p-value]	4.45 [0.00]	9.13 [0.00]	4.39 [0.00]	8.92 [0.00]
Sargan statistic $\chi^2(12)$ [p-value]	38.5 [0.00]	16.6 [0.17]	32.3 [0.00]	16.8 [0.16]
Exogeneity test (joint)	$\chi^2(30)=2.5$	$\chi^2(30)=11.7$	$\chi^2(56)=3.1$	$\chi^2(56)=9.7$

Notes: (i) All models include a quadratic in experience and dummy variables for educational qualifications, region and year; the extended specification also includes dummy variables for one-digit occupation and industry, public sector employment, establishment size, trade union coverage, and temporary and fixed-term employment; (ii) Instruments are spouse's hourly wage, 3 dummy variables for spouse's participation (employee, self-employed) and work hours, 8 dummy variables for spouse's occupation, and total number of employed household members; (iii) the dependent variable is the log of the real gross hourly wage; (iv) housework is in hours per week; (v) t-statistics in parentheses; (vi) * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 9: The Effect of Housework on Wages: Alternative (lagged) Housework Measure (FE model)

	Basic wage equation		Extended wage equation	
	Women	Men	Women	Men
	(1)	(2)	(3)	(4)
Single	-0.0003	-0.0011	-0.0001	-0.0008
	(-0.30)	(-0.79)	(0.09)	(-0.63)
Married	-0.0015***	-0.0002	-0.0014***	0.0002
	(-3.19)	(-0.24)	(-2.94)	(0.25)

Notes: (i) All models include a quadratic in experience and dummy variables for educational qualifications, region and year; the extended specification also includes dummy variables for one-digit occupation and industry, public sector employment, establishment size, trade union coverage, and temporary and fixed-term employment; (ii) the dependent variable is the log of the real gross hourly wage; (iii) housework is in hours per week; (iv) t-statistics in parentheses; (v) * significant at 10%; ** significant at 5%; *** significant at 1%

Table 10: Housework and Children by Marital Status and Gender

	Own child in household	**No own child in household**
	Men	
Married	4.977	4.552
	(4.81)	(4.26)
Single	11.983	4.292
	(7.41)	(4.52)
	Women	
Married	14.712	11.487
	(8.30)	(7.33)
Single	12.938	6.369
	(7.67)	(6.16)

Notes: (i) Standard deviations in parentheses; (ii) Housework is reported in hours per week.

Table 11: Robustness Checks (FE model)

	Single women (1)	Single men (2)	Married women (3)	Married men (4)
Controlling for presence of children				
Housework	0.0009	-0.0020	-0.0012**	-0.0014**
	(0.93)	(-1.50)	(-2.28)	(-2.14)
No of own children in h/hold	0.0373**	0.0401	-0.0401***	0.0197***
	(2.12)	(0.69)	(-6.45)	(4.72)
Interactions with presence of children				
Housework	0.0006	-0.0021	-0.0008	-0.0012
	(0.60)	(-1.57)	(-1.34)	(-1.38)
No of own children in h/hold	0.0207	-0.0044	-0.0329***	0.0207***
	(0.72)	(-0.05)	(-3.52)	(4.13)
H/work * no of children	0.0011	0.0032	-0.0005	-0.0002
	(0.73)	(0.58)	(-1.03)	(-0.36)
Including age instead of experience				
Housework	-0.0000	-0.0025**	-0.0016***	-0.0011
	(-0.04)	(-2.13)	(-3.53)	(-1.84)
Including part-time workers				
Housework	-0.0006	-0.0020	-0.0012***	-0.0020***
	(-0.73)	(-1.49)	(-3.23)	(-2.95)
Part-time	0.0202	0.1974***	0.0282***	-0.0370**
	(1.27)	(7.10)	(3.54)	(-2.02)

Notes: (i) All models include a quadratic in experience and dummy variables for educational qualifications, region and year; (ii) the dependent variable is the log of the real gross hourly wage; (iii) housework is in hours per week; (iv) Sample sizes in third panel are: single women, 5699; single men, 6748; married women, 11184; married men, 18619 (other panels as per Table 2); (v) *t*-statistics in parentheses; (vi) * significant at 10%; ** significant at 5%; *** significant at 1%.

Appendix

Table A1: Definition of variables

Variable	**Definition**	**Derived from BHPS variable(s)**
Log wage	Log of gross hourly wage, assuming overtime rate is 1.5. Indexed to 2004 prices. Wage = (usual gross pay per month * 12/52) / [(usual standard weekly hours)+ 1.5*(usual weekly paid overtime hours)].	wPAYGU, wJBHRS, wPDOT.
Housework	Average weekly hours of housework.	wHOWLNG
Age	Age at date of interview (years)	wAGE
Married	Dummy variable equal to 1 if currently married or cohabiting, and 0 otherwise	wMASTAT
Experience	Total years in employment, including self-employment	Variables from records BLIFEMST, CLIFEJOB, wJOBHIST, wINDRESP.
Highest qualification Degree Further education A-level O-level Other qualification	Dummy variables equal to 1 if have qualification, and 0 otherwise First or higher degree Teaching or nursing qualification; other higher qualification A-level or equivalent (high school diploma) GSCE grades A-C, O-level or equivalent (end of compulsory schooling) Commercial qualification, GCSE grades D-G or equiv, apprenticeship, other qualification	wQFEDHI
Region	11 dummy variables equal to 1 if live in region, and 0 otherwise. Regions are London (inner and outer London), South East, South West, East Anglia, East Midlands, West Midlands, North West (Greater Manchester, Merseyside and NW region), Yorkshire (Yorkshire and Humberside), North (Tyne and Wear, and North region), Wales, and Scotland.	wREGION
Firm size	6 dummy variables equal to 1 if belong to workplace with given number of employees, and 0 otherwise. Categories are: 1-24, 25-49, 50-99, 100-499, 500-999, 1000+.	wJBSIZE

continued

Table A1 continued

Occupation	9 dummy variables equal to 1 if employed in SOC90 one-digit occupation, and 0 otherwise. Categories are: managers & administrators, professional occupations, associate professional & technical occupations, clerical occupations, craft & related occupations, personal & protective service occupations, sales occupations, plant & machine operatives, and routine occupations.	wJBSOC
Industry	9 dummy variables equal to 1 if in industry category, and 0 otherwise. Categories, based on SIC80 and SIC92 one-digit industries, are: agriculture, mining and utilities, manufacturing, construction, retail and hotels, communications, finance and property, health and social, other industries (inc administration and education).	wJBSIC (waves 2-11), wJBSIC92 (waves 12-14)
Trade union covered	Dummy variable equal to 1 if trade union or staff association at workplace, and 0 otherwise.	wTUCOV
Public sector	Dummy variable equal to 1 if employed in public sector (exc armed services), and 0 otherwise.	wJBSECT
Temporary contract	Dummy variable equal to 1 if in seasonal, agency or casual employment, and 0 otherwise.	wJBTERM, wJBTERM1, wJBTERM2
Fixed-term contract	Dummy variable equal to 1 if employed on fixed-term contract, and 0 otherwise.	wJBTERM, wJBTERM1, wJBTERM2
Number of employed in household	Number of household members in employment	wNEMP
Spouse employee	Dummy variable equal to 1 if spouse works as employee, and 0 otherwise.	wJBHAS, wJBOFF, wJBSEMP
Spouse self-employed	Dummy variable equal to 1 if spouse is self-employed, and 0 otherwise.	wJBHAS, wJBOFF, wJBSEMP
Spouse's work hours	Total usual weekly hours worked by spouse in main job (0 if not working).	wJBHRS, wJBOT, wJSHRS
Spouse's occupation	9 dummy variables equal to 1 if spouse works in SOC90 one-digit occupation, and 0 otherwise.	wJBSOC
Spouse's wage	Spouse's real gross hourly wage (0 if not working).	wPAYGU, wJBHRS, wPDOT.

Notes: (i) w denotes BHPS wave B–N (2–14); (ii) creation of spousal variables also requires within-household linking variables.

Table A2: Summary statistics

	All (1)	Men (2)	Women (3)	Single men (4)	Single women (5)	Married men (6)	Married women (7)
Log wage	2.140	2.207	2.040	1.941	1.939	2.309	2.094
Housework	7.063	4.659	10.638	4.382	7.125	4.764	12.507
Married	0.695	0.724	0.653	---	---	---	---
Age	38.044	38.632	37.170	30.190	32.291	41.853	39.764
Experience	19.428	21.012	17.071	13.058	13.778	24.047	18.823
Degree	0.166	0.163	0.172	0.160	0.190	0.164	0.162
Further education	0.308	0.318	0.292	0.264	0.263	0.339	0.307
A levels	0.136	0.142	0.128	0.182	0.160	0.127	0.111
O levels	0.201	0.177	0.237	0.216	0.239	0.162	0.236
Other qualifications	0.082	0.080	0.083	0.090	0.085	0.077	0.082
London	0.094	0.090	0.101	0.117	0.128	0.079	0.087
South east	0.200	0.192	0.212	0.191	0.227	0.192	0.204
South west	0.088	0.096	0.075	0.093	0.076	0.097	0.075
East Anglia	0.039	0.042	0.034	0.035	0.028	0.045	0.038
West Midlands	0.092	0.098	0.084	0.089	0.084	0.101	0.084
North West	0.109	0.108	0.110	0.112	0.100	0.106	0.115
Yorkshire	0.088	0.088	0.088	0.079	0.073	0.092	0.096
North	0.068	0.068	0.069	0.072	0.068	0.067	0.069
Wales	0.051	0.051	0.050	0.060	0.060	0.047	0.046
Scotland	0.084	0.075	0.096	0.065	0.097	0.079	0.096

Continued

Table A2 continued

	All (1)	Men (2)	Women (3)	Single men (4)	Single women (5)	Married men (6)	Married women (7)
Firm size 1-24	0.291	0.279	0.309	0.313	0.336	0.266	0.294
Firm size 25-49	0.135	0.125	0.149	0.135	0.145	0.121	0.152
Firm size 50-99	0.127	0.129	0.124	0.113	0.119	0.135	0.127
Firm size 100-199	0.115	0.117	0.112	0.105	0.104	0.122	0.116
Firm size 200-499	0.147	0.162	0.123	0.148	0.123	0.168	0.124
Firm size 500-999	0.077	0.084	0.068	0.084	0.056	0.084	0.074
Firm size >1000	0.109	0.104	0.115	0.102	0.118	0.105	0.113
Manager	0.171	0.190	0.144	0.109	0.137	0.221	0.147
Profesional	0.117	0.107	0.132	0.087	0.107	0.115	0.145
Technician	0.116	0.105	0.133	0.110	0.128	0.103	0.136
Clerical	0.183	0.094	0.314	0.143	0.320	0.076	0.311
Craft	0.126	0.189	0.033	0.209	0.031	0.181	0.033
Personal	0.082	0.062	0.112	0.061	0.133	0.062	0.102
Sales	0.049	0.043	0.058	0.062	0.071	0.036	0.052
Operative	0.107	0.150	0.042	0.145	0.039	0.152	0.044
Unskilled	0.049	0.060	0.033	0.074	0.036	0.054	0.031

Continued

Table A2 continued

	All	Men	Women	Single men	Single women	Married men	Married women
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Trade Union	0.519	0.496	0.552	0.451	0.489	0.514	0.585
Public	0.257	0.192	0.353	0.175	0.293	0.199	0.386
Agriculture	0.010	0.013	0.004	0.017	0.005	0.012	0.003
Mining	0.022	0.029	0.012	0.019	0.010	0.032	0.013
Manufacture	0.250	0.319	0.148	0.287	0.134	0.331	0.156
Construction	0.037	0.056	0.009	0.067	0.011	0.052	0.008
Retail & hotels	0.153	0.148	0.162	0.196	0.191	0.129	0.146
Communications	0.069	0.090	0.039	0.081	0.041	0.093	0.039
Finance & property	0.149	0.140	0.163	0.145	0.173	0.139	0.157
Other industries	0.215	0.168	0.285	0.153	0.262	0.173	0.296
Social & health	0.094	0.037	0.179	0.035	0.172	0.038	0.182
Temporary contract	0.017	0.015	0.020	0.035	0.031	0.008	0.015
Fixed-term contract	0.022	0.020	0.024	0.033	0.032	0.016	0.020
Observations	30153	18030	12123	4979	4209	13051	7914
Individuals	4765	2574	2191	1179	1115	1903	1585