

Basilio, Leilanie

**Working Paper**

## Deciding Who Works Where – An Analysis of the Distribution of Work within Native and Immigrant Families in Australia

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Leilanie Basilio

# Deciding Who Works Where

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#125



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Universitätsstr. 150, 44801 Bochum, Germany

Technische Universität Dortmund, Department of Economic and Social Sciences

Vogelpothsweg 87, 44227 Dortmund, Germany

Universität Duisburg-Essen, Department of Economics

Universitätsstraße 12, 45117 Essen, Germany

Rheinisch-Westfälisches Institut für Wirtschaftsforschung (RWI)

Hohenzollernstr. 1/3, 45128 Essen, Germany

## **Editors:**

Prof. Dr. Thomas K. Bauer

RUB, Department of Economics

Empirical Economics

Phone: +49 (0) 234/3 22 83 41, e-mail: thomas.bauer@rub.de

Prof. Dr. Wolfgang Leininger

Technische Universität Dortmund, Department of Economic and Social Sciences

Economics – Microeconomics

Phone: +49 (0) 231 /7 55-32 97, email: W.Leininger@wiso.uni-dortmund.de

Prof. Dr. Volker Clausen

University of Duisburg-Essen, Department of Economics

International Economics

Phone: +49 (0) 201/1 83-36 55, e-mail: vclausen@vwl.uni-due.de

Prof. Dr. Christoph M. Schmidt

RWI

Phone: +49 (0) 201/81 49-227, e-mail: christoph.schmidt@rwi-essen.de

## **Editorial Office:**

Joachim Schmidt

RWI, Phone: +49 (0) 201/81 49-292, e-mail: joachim.schmidt@rwi-essen.de

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**Leilanie Basilio\***

## **Deciding Who Works Where – An Analysis of the Distribution of Work within Native and Immigrant Families in Australia**

### **Abstract**

The paper examines whether there is an asymmetry in the distribution of market work and domestic work within families in Australia, and to what extent differences in earnings capacities of spouses can account for the division of labor. Using a Blinder-Oaxaca Tobit-type decomposition, we find that the difference in earnings capacities of Australian couples could explain about 30 and 20 percent of the observed disparities in spousal time allocation in market and domestic work, respectively. Most of the work gaps, however, appear to be accounted for by the differences in labor supply behaviors of partners rather than by the differences in earnings capacities. We further observe that the differences in wages are more relevant for immigrant families originating from non-English speaking countries. Convergence of gender wages would produce the greatest reduction in spousal specialization for this particular group. Given that immigrant women from non-English speaking background have high levels of formal qualifications, our results could assert the significance of improving the returns to human capital attributes of these immigrant women in reducing the imbalance in spousal work distribution.

JEL Classification: J22, D13, J16

Keywords: Household time allocation, housework, gender effects

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# 1 Introduction

Over the past couple of decades, productive activities of households both within and outside the formal market have received renewed interest from a heterogeneous array of disciplines. The recognition of home production is with good reason as it is far from being a trivial fraction of aggregate output. Estimates indicate that home production accounts for about 40 to 60 percent of gross national product in most Western countries (Bonke 1992). In addition, the total amount of time devoted to work at home is about equal to the time spent in the market (Robinson and Godbey 1997). As a household is essentially a collection of individuals, valuations of household output are complemented with studies looking at the division of labor among its members and more commonly between spouses. While gender disparities in total amount of work have been less marked (Coltrane 2000; Burda *et al* 2007), the skewness in sectoral time allocation of couples has been well acknowledged, with men assuming a greater proportion of paid labor and women undertaking most of the domestic work. Much interest has been directed towards understanding where the imbalance might arise from.

Such specialization is similarly evident in Australia. The husband-wife differential in paid work is about 20 hours a week, while the gap in domestic work including time spent on childcare is approximately (minus) 20 hours<sup>1</sup>. A loose comparison, noting the fact that time use data are not precisely comparable across countries, shows that these mean differences are close to those of Western European countries but higher than those observed for the United States, where the gaps are about 13 and -12 hours for paid and unpaid work, respectively (Burda *et al* 2007). On average, married women in Australia perform almost twice as much household work as married men. This paper adds to the understanding of household time allocation by analyzing the determinants of both market and domestic labor supply of couples in Australia.

Several explanations have been put forward to address the questions of why husbands and wives segregate various tasks and why they allocate time differently.

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<sup>1</sup> HILDA 2002-2006. Sample criteria and distribution of work are detailed in Section 3.

Theories of exchange, relative efficiency and bargaining posit that individual resources play a key role in intra-household time allocation (Mincer 1962; Becker 1965; Gronau 1977; McElroy and Horney 1981; Manser and Brown 1980, among others). That is, the partner with more resources – which may consequently reflect greater earnings potential – will devote more time to the formal labor market. Sociological insights, on the other hand, suggest that societal norms, which assign exclusive roles by gender, may override the importance of labor market-relevant characteristics in household decision-making. It thus remains an empirical question as to the extent to which spousal disparity in earnings capacities accounts for the asymmetry in work distribution.

Using a Blinder-Oaxaca type Tobit-decomposition, this paper decomposes the labor supply differential between husbands and wives into two sources: (i) due to differences in spouses' potential earnings, which are based on observable characteristics such as educational attainment, age, health condition and others; and (ii) due to differences in weights assigned by husbands and wives to these measured characteristics when determining their labor supply. The differences in weights are often presumed to quantify the structural influence of gender-assigned roles in households and have been referred to as *gender effects* (Alvarez and Miles 2003).

Specialization is not an issue *per se*. As Becker (1981) argues, the division of labor reflects a rational decision of the household aimed at maximizing the aggregate family utility. However, if valuations attached to paid and unpaid work differ, with the latter usually assigned a lower exchange value, the distribution of work may become a welfare concern. A disproportionately high share of domestic work and low share of market work for an individual may lead to a bargaining disadvantage within a relationship and poorer opportunities in the event of marital breakdown.

Washbrook (2006) asserts that investigating the role of wages in time allocation is crucial because it suggests how the development of relative human capital and convergence of returns to these skills might affect couples' labor supply decisions. Using data on the evolution of educational attainment in Australia, Kidd and Shannon (2002) predict a continued progress in the relative level of female human capital and their relative pay. An important consequent question is: Would such a



narrowing gender pay gap translate to a more equal work distribution within the household?

We are not aware of any studies that decompose the spousal differential in market and non-market work in Australian households. We believe that it is worthwhile to decompose the source of disparity in spousal time allocation as this will give us an indication of the importance of human capital attributes vis-a-vis gender-specific effects. This will also give an insight as to how the evolution of gender pay gap could influence the division of labor among Australian couples.

Despite the fact that immigrant families make up a substantial part of the Australian population, to our knowledge, there has not been any study that analyze their time allocation behavior. As with other important immigration countries, married female immigrants have lower labor force participation relative to their husbands. While there are several studies that examine the labor participation of married immigrants in Australia vis-a-vis married male immigrants, comparison of their non-market activities have been overlooked. One reason for this could be the scarcity of data as immigrants are often under-represented in Time Use Surveys. Ethnic groups could vary in their views of male and female roles in the family, household composition and childrearing. Neglecting to distinguish between native and immigrant families could mask interesting differences in the family behavior of different groups. Reimers (1985) surmises that such differences may lead to systematic differences in the labor supply of immigrant wives. The wage ratio for immigrant couples may also differ from that of native families due to differences in human capital and returns to these characteristics, which could in turn result in immigrant families allocating their time differently to natives. Using data from the Housing, Income and Labour Dynamics in Australia (HILDA) survey, we are able to conduct the analysis for natives and immigrant families separately and address that gap in the literature.

In carrying out our analysis, we draw from the procedure of Washbrook (2006). We predict a gross hourly full-time wage for each individual based on his or her human capital characteristics. This technique simultaneously addresses the problems of missing wages for non-participants and the endogeneity of observed wages due to

the correlation of wages with labor supply. Because of the censored nature of hours of work, we perform Tobit estimations on labor supply and use these estimates to perform a Blinder-Oaxaca type decomposition.

The remainder of the paper is structured as follows: Section 2 provides a summary of major theoretical approaches and empirical evidence covering intra-household time allocation. Section 3 explains our sample selection criteria, provides descriptive statistics and presents the empirical strategy. Section 4 discusses the results of our estimations. Finally, Section 5 summarizes and concludes.

## 2 Literature and Theoretical Framework

Since intra-household time allocation has become an academic pursuit, various behavioral models have been offered to explain what influences households in distributing tasks. Mincer (1962), Becker (1965), Gronau (1977) and others have developed *household production models* where the household maximizes its welfare subject to budget and time constraints. Household welfare is derived from leisure and consuming commodities produced using a combination of market goods and time inputs of members. Their framework highlighted responses of individuals to prices of market goods and time, income and technologies that influence the production of home goods. In this respect, the division of labor between spouses is based on their relative productivities in paid and unpaid work, with productivity being effectively measured by the wages they could obtain in the market.<sup>2</sup> The spouse with lower opportunity costs in terms of forgone market earnings will spend more time in paid work and less on home production.

Another body of research proposes that bargaining power influences household decision-making. Bargaining theories yield the same prediction as the relative productivity approaches wherein the spouse with higher wage or non-labor income exhibits more power over the allocation of resources including time. In case of cooperative bargaining, this power is based on the threat point, which is interpreted as the utility an individual gets by getting divorced and is a positive function of the

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<sup>2</sup> This approach is apparently predicated on the implicit assumption that spouses have the same productivity at home.

individual's market wage (McElroy and Horney 1981; Manser and Brown 1980). In the model of Lundberg and Pollak (1993), the threat point is not divorce but a non-cooperative equilibrium where spouses remain in the relationship but voluntarily retract to "separate spheres" that reflect traditional gender roles.

Comparative advantage and bargaining theories, in other words, posit that couples decide time allocation to maximize household welfare without explicit consideration of gender. However, empirical evidence suggests that these models cannot fully explain the asymmetry in the division of labor. Sociologists, and more recently economists, acknowledge that norms and socially recognized gender roles exhibit substantial influence on family decisions. In an attempt to explain this irregularity, Akerlof and Kranton (2000) incorporate *identity* – a socially determined sense of oneself – in the utility function and assert that the unequal division of labor is a result of the individual trying to maximize payoffs by affirming their identity in society. Given social expectations, a husband loses identity when he does housework or when his wife earns more than half of the household income. Equality of utility is only restored when the wife performs more housework than the husband. Therefore, an identity model of household time-allocation predicts an asymmetry in the division of labor between husbands and wives.

Using Spanish data, Fernandez and Sevilla-Sanz (2006) find support for the identity hypothesis. They observe that wives who earn more than their husbands still undertake more than 50 percent of housework in line with expected gender identities. To provide evidence on how important gender specific effects are to housework allocation of Spanish two-earner couples, Alvarez and Miles (2003) perform an Oaxaca (1973) decomposition based on estimates of spouses' housework in a bivariate framework. Their analysis shows that 90 percent of the increase in the probability of egalitarian behavior in housework allocation is due to the adjustment for gender effects. Washbrook (2006) applies a Tobit-type Oaxaca (1973) decomposition to both paid and unpaid work of husbands and wives using UK Time Use Survey data. She finds that differences in earnings capacity can account for about 40 percent of the market work gap and only 16 percent of the domestic work differential. She asserts that large gender fixed effects result in women performing far more domestic

work than men with similar wage rates.

For the case of Australia, Bittman *et al* (2003) provide evidence on the effects of income on housework using the 1992 Time Use Survey data. Their results show that women decrease their housework as their income share increases but only up to the point where the spouses contribute equally to household income. When women provide more than half of the household income, they tend to do more housework, seemingly to compensate for the households' deviation from the normative standard of men being the breadwinners. They conclude that while income and characteristics explain some of the allocation of housework between spouses, at some point gender does trump money.

With respect to distinguishing immigrant families from native households, van Klaveren *et al* (2006) analyze the time allocation behavior of Dutch, Turkish and Surinamese/Antillean households in the Netherlands. Their results reveal that males and females increase the number of hours supplied to the labor market when their own wage rate increases and decrease their labor supply when their respective partner's wage increases. The wage elasticities for Dutch and Surinamese/Antillean males are very similar. They also find that the power weight, interpreted as the share of the individual in the household utility, depends on the hourly wage rates for Dutch and Turkish households but not for Surinamese/Antillean households. This suggests that an increase in the individual's wage rate in Dutch or Turkish households will shift the power distribution in favor of this individual.

## 3 Data and Empirical Strategy

### 3.1 Data Description

Our study uses unit record data from the Housing, Income and Labour Dynamics in Australia (HILDA) Survey<sup>3</sup> for the period 2002 to 2006.<sup>4</sup> The HILDA Survey

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<sup>3</sup> The HILDA Project was initiated and is funded by the Australian Government Department of Families, Housing, Community Services and Indigenous Affairs (FaHCSIA) and is managed by the Melbourne Institute of Applied Economic and Social Research (MIAESR). The findings and views reported in this paper are those of the author and should not be attributed to either FaHCSIA or the MIAESR.

<sup>4</sup> The data was extracted using the Stata® add-on package PanelWhiz v1.0 (October 2006) written by John P. Haisken-DeNew (john@PanelWhiz.eu). The PanelWhiz-generated DO file and

is an annual survey which includes a module on individual time use. The module summarizes the amount of time respondents spend on an activity in a *typical week*. Respondents are asked how much time they spend on paid employment, travel to and from work, household errands, housework, outdoor tasks, playing with and looking after their own children and of others', and participation in care and volunteer work.

Other time allocation studies use Time Use Surveys (TUS), which collect data via the time diary method where respondents are asked to record every episode of time use on a *specified* day or series of days. Using time use data from annual surveys and TUS have their own merits and limitations. Time diaries tend to be preferred because it is believed that some activities are difficult to recall and that there is a potential overestimation in annual surveys because respondents tend to pick a day when an activity is prominent and treat that as an average day (Juster and Stafford 1991). On the other hand, annual surveys have lower sampling variability for activities like repairs and home improvement. Since time diaries are only administered on a day or a few days, such episodic activities, which require a large amount of time, could produce a distribution that has too many cases of zero value and too many with very large values. In addition, annual surveys are based on bigger samples and are far more representative of the population including, for our purpose, immigrant households. Using annual surveys, given larger sample sizes and a wider set of demographic variables, allows for a more accurate prediction of wages based on characteristics.

For the empirical analysis, we restrict our sample to married individuals who are of working age (15 to 65). We exclude individuals who do not live together with their respective spouses for the apparent reason that they cannot share housework with their partners. On the other hand, we include all individuals whether or not they participate in the formal labor market to avoid undermining the sexual division of labor. In later analysis, we will present results for couples where both spouses undertake paid work. After excluding observations with missing values for variables used in the analysis, we have a sample of 2,744 unique couples or 7,633

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plugins used to retrieve the data are available upon request. Any data or computational errors of those of the author. Haisken-DeNew and Hahn (2006) describe PanelWhiz in detail.

couple-year observations, of which 85 percent are *native families* (both the husband and the wife are born in Australia) and 15 percent are *immigrant families* (both the husband and the wife are immigrants). While it would also be interesting to examine the mechanisms within an intermarriage, that is, a union between a native and an immigrant, issues of endogeneity in intermarriages have been raised in the literature (see, for instance, Meng and Meurs 2009; Meng and Gregory 2005). Such endogeneity problem could potentially confound our wage predictions. Thus, for this particular paper, we will limit our analysis to couples where spouses are either both Australian-born or are both immigrants.

Tables 1a and 1b present summary statistics of a range of socio-economic variables relevant to our analysis for the full sample and also for subgroups. The average age gap between spouses is two years, with men averaging 45 years and women about 43 years. While the share of men with a bachelor's degree or higher is not materially different from that of women, a somewhat greater proportion of the male sample have finished Year 12 (the final year of high school) or have obtained a diploma. The average employment rate of men in our sample is about 86 percent, which is 20 percentage points higher than that of women. A third of the females are out of the labor force and almost half of those who are employed tend to work on a part-time basis.

Immigrants in our sample, on average, tend to be older than native Australians, with immigrants coming from Main English Speaking countries (MES)<sup>5</sup> being the oldest of all groups. A large proportion of immigrants from non-MES countries have higher educational degrees, 40 percent and 37 percent of men and women, respectively. These are remarkably higher than those of Australian-born (26 percent for both genders) and than those of migrants with English-speaking background (27 percent for men and 26 percent for women). However, despite having higher level of formal qualifications, immigrants from non-MES countries have lower employment participation rates, particularly females. Note that the difference in employment rates of spouses is about 20 percentage points irrespective of ethnicity.

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<sup>5</sup> Main-English Speaking countries are United Kingdom, New Zealand, Canada, USA and South Africa (HILDA Online Data Dictionary 2008).

Tables 2a and 2b present the division of labor between spouses. A set of definitions of the different types of tasks are provided in Appendix - Table A1. We find that, in general, the average number of hours that men and women spend on *total work*, i.e. combined market and domestic work<sup>6</sup>, is not statistically different, which is observed in other studies (see, for instance, Burda *et al* 2007). This holds with the exception of couples in non-MES households, where wives work slightly longer in total than their husbands. We find evidence for conventional gender specialization: a statistically significant husband-wife gap of about 20 hours of paid employment and about (minus) 20 hours of domestic work. Husbands tend to be more willing to share household work that involves outdoor tasks such as repairs, gardening or car maintenance. These activities are usually perceived as “male tasks” so even within household production there seems to be an evidence of segregation of work. Husbands also tend to participate more, relative to other household tasks, in childcare activities.<sup>7</sup> The male-female wage differential is positive and statistically significant, hence there is an indication that the distribution of work may be partly due to earnings.

Immigrants from non-English speaking countries have the least number of hours spent on paid employment. While the gender gap in domestic work is nearly the same for this group as with others, the differential in market labor hours is lowest because of significantly less market work hours of non-MES men compared to other males. Immigrants with English-speaking background receive higher hourly wages, particularly the men, and they perform the least amount of domestic work. This could imply that having higher earnings facilitates substitution towards purchased goods and services and away from household production. While the direction of the wage gap generally supports the greater attachment of males to the formal labor market, by comparing subgroups, a higher wage gap does not necessarily translate to greater specialization.

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<sup>6</sup> In this analysis, we use the term *domestic work* interchangeably with *unpaid work* and *household production*.

<sup>7</sup> Some studies do not consider childcare as household work since this activity potentially offers utility or enjoyment to the person. We nevertheless include it in our analysis as it is an important unpaid activity.

### 3.2 Predicting Earnings Capacity

Since the paper aims to measure the extent of association between time allocation and the individuals' absolute and relative earnings capacities, it is worth discussing how we define and obtain the wage variables. Throughout our analysis, we use gross hourly wages. The use of net hourly wages, as with Washbrook (2006), is problematic because they are determined jointly with the number of hours of paid work due to the progressive tax system. For instance, given the same gross wage, a person who works longer hours would have a lower net hourly wage than someone who works only for a few hours because of the non-linearity of marginal tax rates.

We predict the gross hourly wage rate that an individual would receive on a full-time basis. The expected full-time wage is predicted based on the individual's level of human capital and personal characteristics and the returns to these factors in the labor market. This technique simultaneously addresses two issues. Firstly, since we want to include individuals who do not participate in the labor market in the analysis, the procedure addresses the problem of missing wages for non-participants. Secondly, we could alleviate the potential endogeneity problem in observed wages brought about by the decision to work part-time. In a conventional labor supply model, an individual is assumed to be offered a constant gross wage and the individual decides how many hours to supply. However, evidence suggests this is not necessarily the case (Simpson 1986; Ermisch and Wright 1993). Part-time jobs, for instance, may offer lower wages in exchange for greater flexibility. Consider the case where a wife could obtain a full-time wage equal to her husband's. As a result of household decision-making, she chooses to specialize in domestic work and take a part-time job at a lower wage. Comparing the observed wages of the husband and the wife would suggest that she has chosen to specialize in domestic work partly because her potential earnings are lower, when the causation runs the other way around. Predicted full-time wages thereby represent the underlying earnings capacities of individuals, and the trade-off of lower wages for job flexibility works only through the decision to take a part-time job (Washbrook 2006).

The potential wages of part-time workers and non-participants would likely be overestimated by predicting individuals' full-time wages by applying estimated coef-



ficients obtained from a Mincer-type equation on full-time workers. This is partially because full-time employees may be more productive than part-time workers doing the same job due to longer work experience and training even though they may have the same formal qualifications. In addition, workers who self-select into full-time employment may possess unobservable characteristics that result in higher wages. Rodgers (2004) finds that lower part-time wages in Australia can be explained by both selection into type of employment and levels of human capital.

Wage equations are estimated separately for full-time workers and for those who work part-time or who are not part of the labor market, and also separately for husbands and wives. We follow the procedure of Washbrook (2006) and predict the earnings capacities of full-time employees using the estimated coefficients obtained from the wage regression for the sample of full-time workers. On the other hand, for part-time workers and non-participants, we make the underlying assumption that their potential wages are drawn from the 25th percentile of the conditional full-time wage distribution.<sup>8</sup> In doing so, we assume that the wages these individuals would receive for full-time work are lower than those of actual full-time workers because of the reasons outlined above. Quantile regression models are applied to estimate the coefficients at the 2th percentile and to obtain the predicted wage.<sup>9</sup>

### 3.3 Labor Supply Estimations

We consider a Tobit model for labor supply in order to take into account the nature of our dependent variable *hours of work*, of which the distribution is censored from below at zero due to non-participation in either the formal market or domestic work. Technically, hours worked could be described as a response variable that takes on the value zero with positive probability but is a continuous random variable over strictly positive values (Wooldridge 2002). We write the Tobit model as follows:

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<sup>8</sup> In a similar fashion, Devereaux (2004) imputed the wages of nonworkers by using the wage distribution of workers who work 1-13 weeks.

<sup>9</sup> For comparison, we carried out the analysis by simply applying the estimated coefficients derived from wage regressions on all employed individuals (where a dummy for part-time workers was included) to everyone in the sample. This procedure indeed increases the predicted wages for part-time workers and more notably for non-participants. While the effects of wages on market and domestic work are weakened, the overall qualitative effects are similar to the results obtained using the approach we discussed above. In Section 4, we obviate the need for predicting wages for non-participants by restricting the analysis to couples where both spouses are employed.

$$Y_{gi}^* = \mathbf{Z}_{gi}\theta_g + \varepsilon_g, \quad (1)$$

where  $Y = M, H$ , market and domestic labor supply, respectively

$g = h, w$ , husband and wife, respectively

$i = 1, \dots, N$ , individuals and  $\varepsilon_g \sim N(0, \sigma_g^2)$

and where

$$\begin{aligned} Y_{gi} &= Y_{gi}^* = \mathbf{Z}_{gi}\theta_g + \varepsilon_g && \text{if } Y_{gi}^* > 0 \\ &= 0 && \text{otherwise.} \end{aligned} \quad (2)$$

We also specify

$$\mathbf{Z}_{gi}\theta_g = \mathbf{W}_{gi}\delta_g + \mathbf{X}_{gi}\beta_g, \quad (3)$$

where  $\mathbf{W}_{gi}$  is a vector of predicted absolute and relative wage rates of individual  $gi$  as predicted from observable characteristics in the manner outlined above, and  $\mathbf{X}_{gi}$  is a vector of controls including age groups, number of children in different age brackets, and household non-labor income (where applies).

The expected value of hours of work given the observable characteristics is comprised of the probability of  $Y_{gi}$  being uncensored and the expectation of  $Y_{gi}$  given a positive level:

$$\begin{aligned} E[Y_{gi}|\mathbf{Z}_{gi}] &= P(Y_{gi} > 0|\mathbf{Z}_{gi}) E[Y_{gi}|Y_{gi} > 0, \mathbf{Z}_{gi}] \\ &= \Phi\left(\frac{\mathbf{Z}_{gi}\theta_g}{\sigma_g}\right) \mathbf{Z}_{gi}\theta_g + \sigma_g\phi\left(\frac{\mathbf{Z}_{gi}\theta_g}{\sigma_g}\right), \end{aligned} \quad (4)$$

where  $\phi(\cdot)$  and  $\Phi(\cdot)$  are standard normal density and cumulative normal density functions respectively, and  $\sigma_g$  is the standard error of  $\varepsilon_g$  (see Wooldridge (2002) for derivation).

### 3.4 Decomposition Analysis

We use a decomposition analysis to determine the extent to which earnings capacities influence the time allocation behavior of husbands and wives. We isolate the element of the differences in hours of market or domestic work that can be explained

by the differential in potential wages and other covariates from the element that are attributable to the returns to these covariates, in the same vein as the decomposition method proposed by Blinder (1973) and Oaxaca (1973). Since the dependent variable is censored, such that the marginal effects depend on the estimated variance of the error term, the Blinder-Oaxaca linear model decomposition is not appropriate. We follow the procedure for Tobit models developed by Bauer and Sinning (2008)<sup>10</sup> to decompose the mean difference of labor supply between husbands ( $h$ ) and wives ( $w$ ):

$$\begin{aligned}\Delta_{hw}^{Tobit} = & [E_{\theta_h, \sigma_h}(Y_{hit}|\mathbf{Z}_{hi})] - [E_{\theta_h, \sigma_w}(Y_{wi}|\mathbf{Z}_{wi})] \\ & + [E_{\theta_h, \sigma_w}(Y_{wit}|\mathbf{Z}_{wi})] - [E_{\theta_w, \sigma_w}(Y_{wi}|\mathbf{Z}_{wi})].\end{aligned}\tag{5}$$

The first term on the right-hand side of Equation (5) represents the differential in hours worked between husbands and wives due to differences in characteristics of the two groups, while the second term gives the differential attributable to differences in coefficients. The latter term could be interpreted as the gap in hours worked due to different labor supply behaviors of husbands and wives. In the existing literature (e.g. Alvarez and Miles 2003), this has been referred to as the “gender effect”.

The above specification takes the labor supply behavior of husbands as reference, as shown by the use of  $\sigma_h$  in the counterfactual parts of the decomposition. This predicts how much of the hours gap would remain if wives, given their earnings capacity and personal characteristics, behaved in the same manner as their husbands.

## 4 Estimation Results

### 4.1 Labor Supply Estimations

Excerpt of the estimation results of the wage regressions that are used to predict potential earnings are presented in the Appendix - Table A2. The direction of the effects of the covariates are as expected. In particular, we find that higher wages are strongly associated with higher levels of formal schooling both for males

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<sup>10</sup> Bauer and Sinning (2008) give a detailed technical discussion of the decomposition method. We use the Stata add-on program *nldecompose.ado* (v.2008) written by Sinning *et al* (2008) for the empirical analysis.

and females. Women’s wages are negatively correlated with having school-aged children though men’s wages seem statistically insensitive to the presence of children. Overall, there is no significant difference in the wages of Australian-born individuals and immigrants from an English-speaking background. Other immigrants receive lower wages but we find assimilation at least at the 25th percentile.<sup>11</sup> Men who reside in urban areas tend to receive a wage premium even after controlling for levels of human capital and types of industry.

Table 3 presents the findings on the effect of changes in potential earnings on the allocation of time of husbands and wives.<sup>12</sup> Figures 1 and 2 summarize the relationships implied by the estimated coefficients for the benchmark individual aged between 35 and 44, with no child and with a relative wage equal to 1.<sup>13</sup>

We find a strong association between the hours of market work of married men and their earnings capacity. An increase in the absolute potential wage of the husband increases the hours he spends in the formal labor market. This indicates some degree of substitution of earnings for non-market activities, which are now relatively more costly. However, past a particular threshold, higher wage rates are associated with lower levels of hours worked suggesting a backward-bending market labor supply. In the higher end of the wage spectrum, increased purchasing power enables men to spend more time on non-market activities. On the other hand, while the wife’s supply of market work is also positively influenced by her potential earnings, the relationship is not significant.

The results further indicate that the total time devoted to domestic work by the husband is unaffected by changes in his earnings capacity. Taken together with the

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<sup>11</sup> McDonald and Worswick (2007) examined the earnings assimilation of male immigrants in Australia. Using data from Income Distribution Surveys for 1982, 1986 and 1990, they found that male immigrants from non-English backgrounds have significantly lower earnings on arrival relative to comparable native-born males. This earnings disadvantage is nevertheless narrowed as the immigrants’ duration of residence in Australia increases. McDonald and Worswick (2007), however, did not analyze assimilation across different quartiles.

<sup>12</sup> The estimations presented in this paper use a Tobit-model for labor supply for reasons mentioned in the previous section. We also implemented Ordinary Least Squares estimations for verification. The results from these regressions are similar to what we obtain using the Tobit technique including the results for the decomposition analysis. Results using OLS are available upon request from the author.

<sup>13</sup> We also estimated the model for market work excluding individuals who report more than 40 hours of paid work. Doing so does not significantly alter our results.

estimates for market work, this suggests a behavior characteristic of married men – a stronger attachment to the formal labor sector than to household production. At the lower part of the wage distribution, an increase in the absolute wage increases husbands' hours of *total work* – more work in the market with no change in domestic work hours – while at sufficiently high wage levels, an increase in his wage translates to more leisure because of the reduction in market work and no significant change in domestic work.

In contrast, the wife's domestic labor supply exhibits a positive and concave relationship with respect to her earnings potential. The positive association is rather surprising as one would normally expect a substitution away from non-market activities brought about by higher opportunity costs. Nevertheless, the concave profile of domestic work with respect to absolute wages could provide an explanation to this behavior. For a wife in the low wage region, an increase in her wage may not be sufficient to allow her to purchase goods and services that substitute for domestic production. Putting it differently, an increase in her wage would not be adequate to compensate for the utility loss if she is to reduce her household production. Above a certain wage threshold, a higher wage level is associated with lower levels of domestic work hours, which suggests that greater earnings allows for a substitution of purchased goods and services for domestic production. In this respect, it could be argued that higher earners regardless of gender are less strained in terms of total work and enjoy higher levels of leisure.

The coefficient on relative wage, which is the ratio of the individual's absolute wage to the absolute wage of his/her spouse, represents the degree of intra-household bargaining power of the individual in terms of earnings capacity. It is worth noting that the supply of market work of husbands is inelastic with respect to wives' earnings potential. Again, this suggests a strong labor market attachment of married men wherein their supply decisions appear to be insensitive to how much their wives could earn. Wives, on the other hand, cut back on their market hours when their relative wage increases. Both spouses would use their bargaining power to reduce their participation in domestic work. Taking together the negative coefficients of relative wages in both paid and unpaid labor supply of women, it could be inferred

that to some extent women bargain for an increase in leisure as they gain earnings advantage over their husbands.

Having young children (aged less than 15) is unequivocally associated with lower market work hours and significantly higher domestic work for wives. The presence of pre-school age children tilts the time allocation towards domestic work even more as they apparently would demand more supervision. The presence of young children also increases the hours of household work of husbands although the response is not as strong as that of women's, which supports the conventional view that childrearing is largely a woman's domain.

The coefficients on age groups propose a relatively perceptible pattern of time allocation along the life-cycle. Younger cohorts of married individuals work longer hours in the formal labor market and those closer to retirement substantially reduce their hours in paid work. In parallel, younger individuals tend to devote significantly less number of hours to domestic work than middle aged workers. The slightly older cohorts (45-54) also have lower hours of domestic work, possibly because they no longer have dependent children at home and could afford to purchase labor-saving goods and services. Those nearing retirement complete somewhat greater hours of housework than the 45-54 cohorts. The substitution of domestic work for paid work is not perfect and in general, older people tend to have lower total work hours and enjoy more leisure.

Tables 4 and 5 present the marginal impacts of changes in earnings capacity on labor supply of native Australians and immigrants. Immigrant families are further classified into two groups: couples who originally came from Main English-Speaking countries and those from other regions.

Supplies of market work of Australian-born and immigrant husbands are positively and highly significantly associated with higher absolute wages but more so for immigrant men. The estimates imply backward-bending market labor supply curves for all male groups considered. Immigrant wives also tend to react more strongly to changes in wage rates than Australian-born females. However, these relationships are not statistically significant. In a *qualitative sense*, there seems to be no evidence of differences in the market labor behaviors of native and immigrant couples

in terms of responses to absolute wages. That is, the supply of paid work of married men, regardless of nativity, are more strongly and significantly sensitive to economic incentives than the supply of paid work of married women. With respect to relative earnings, only wives in native partnerships seem to consider their spouses' earnings potential and use their bargaining advantage to reduce their hours in the formal labor market.

The strong intra-household bargaining over hours of domestic work observed in the full-sample estimations is apparently driven by the behavior of couples from non-English-speaking countries. For couples in this group, either spouse significantly reduces his or her time spent on domestic activities when he or she gains an earnings advantage over his or her spouse. Non-market activities of immigrants with English-speaking backgrounds are unaffected by spouses' wage potentials. For all couples regardless of nativity, the strong influence of having young children on time allocation is consistent and its impact is stronger for mothers.

## 4.2 Decomposition Results

The results of our decomposition analysis are summarized in Table 6. The estimates presented here use the male labor market behavioral response as the reference.<sup>14</sup> The counterfactual scenario is that, in the absence of inherent differences in gender behavior, wives with given characteristics – absolute and relative wages, age group, and number and age of children – will supply the same amount of work as husbands with the same attributes were supplying.

As with the descriptive statistics, the raw differential in market work for the full sample is about 20 hours with men displaying a greater attachment to the labor market. However, if females would have the same earnings capacities, the gap in paid work would be reduced by about 6 hours. That is, about a third of the work gap could be explained by differences in gender attributes. Although potential wages and characteristics play an important role in the couples' time allocation with respect to

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<sup>14</sup> We find that the decomposition of domestic work gap varies more with the choice of reference equation, which is similar to what Washbrook (2006) observed for UK households. Decomposition results using the female behavioral response as benchmark are available upon request from the author.

market work, much of the differential tends to be accounted for by the difference in their behavior towards market work, or more technically, to the sensitivity of their market labor supply functions to these covariates. In terms of domestic work, the decomposition of the gap reveals that there are weaker effects for characteristics and earnings capacities. Overall, about 80 percent of the gap is due to the difference in gender behavior towards domestic work. We could infer that gender effects figure more strongly in the distribution of domestic work than in market work.

Our results for the full sample provide evidence that the difference in earnings capacities does explain a proportion of the observed differential in spousal time allocation but that most of the work gaps are accounted for by the differences in labor supply behaviors of partners. Social norms or gender preferences seem to influence households towards sustaining gender specialization in sectors of work but more especially in domestic work. Given the magnitudes of the impact of wages on market and domestic labor of partners, the trend towards convergence of wages would appear to equalize shares in market work of spouses more than the distribution of domestic work. We could venture then that the leveling of earnings potentials would mean that women would cut back on their leisure hours as the increase in earnings due to increased wages would not fully translate to substitution of market-provided goods and services for work at home.

We note, however, that there appears to be heterogeneity among subgroups. The overall results laid out above apply more to the native families. For immigrant families, earnings capacities seem to matter more for explaining the differences in market labor hours, accounting for 42 percent of the gap for immigrants from non-English speaking backgrounds and nearly half for families from English-speaking countries. This suggests that if there is an equalization in spouses' levels of human capital or in the returns to their qualifications, the disparity in the distribution of market labor will be more greatly reduced for immigrants than for natives. With respect to domestic work, equalizing earnings potential is most important for immigrants of non-English speaking background. Abstracting from Tables 4 and 5, an improvement in the wages of non-MES immigrant women relative to their husbands' leads to a bargaining power over household work and leads to a more egalitarian



distribution of work at home. Since from the descriptive statistics, non-MES immigrant women have particularly high formal qualifications, which do not fall far behind their husbands' attributes, our results could imply that improving the returns to qualifications of these women would significantly reduce asymmetry in work distribution within non-MES households.

### 4.3 Sensitivity Analysis

#### *The presence of dependent children*

The amount of work required for household production increases with the presence of dependent children and it is reasonable to expect some shifting of hours from market work to home activities or an increase in total work hours and reduction in leisure. Because of cultural norms and biological reasons, the increase in domestic work is expected to affect the time allocation of mothers more strongly. Our earlier results support this premise. In this section, we check if the couples' responses to changes in wages also vary whether or not they have kids, in particular dependent children (15 years old or younger). For a given change in the wage, having children to take care of is expected to limit the choice of hours an individual supplies to the labor market unless there is full substitution of market-provided childcare.

In Table 7 we see a striking contrast in the behaviors of couples without children and couples with dependent children.<sup>15</sup> For childless couples, absolute wages are positively and strongly associated with hours of paid work regardless of gender, although the estimated coefficient is higher for men. Both spouses exhibit backward-bending labor supply curves illustrating the switching relative magnitudes of substitution and income effects over the wage distribution. The similarity of these partners' responses makes it appear as though they were behaving as single individuals. Men without children do not adjust their hours of domestic work with changes in wages. On the other hand, women have lower domestic work associated with higher wages implying shifting of hours towards the paid labor market.

For men with young kids, there is still a significant positive relationship between absolute wages and supply of labor to the formal market. However, the effect is

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<sup>15</sup> We exclude couples with children who are 16 years old or above since we assume that these children do not demand too much care from their parents.

less strong than for childless men. With higher wage rates, mothers to young kids tend to decrease their time in the labor market and less in domestic work as the additional earnings allow them to shift their time to more household production.

The absolute gender work gaps for childless households are remarkably lower than the work gaps for couples with young kids (see Table 8). The market work differential for childless couples is about 11 hours per week which is much lower than the figure of about 27 for couples with young kids, and their domestic work gap is only about a third of that of households with young kids. This indicates that partners without children behave more similarly to each other and even though men spend more time in the market and women in household production, gender specialization within these couples is less stark.

Much of the difference in time allocation of couples with dependent children cannot be explained by the differences in earnings capacities or in the ages of spouses. Overall, our findings suggest that gender effects are significantly relevant in households with kids, as mothers tend to adjust their time allocation more than their husbands do, particularly by reducing their hours in the formal labor market. While the absolute husband-wife gap in the domestic work among childless couples is lower, we note that most of this gap could be attributed to differences in gender behavior.

#### *Dual-earner households*

In order to reduce unobserved heterogeneity, most studies only include households where both spouses are employed although doing so weakens the relevance of the division of labor (Washbrook 2006). Restricting the sample to two-earner families to some extent allows comparison of spouses in similar conditions.

Two-earner households comprise 60 percent of our original sample; the rest consists of families either with only one breadwinner or both spouses not participating in the formal labor market. Since we leave out individuals reporting zero hours of work, we estimate our model using OLS instead of Tobit. Results of our estimations are summarized in Table 9. The responsiveness of males' market work to absolute wages is considerably lower compared to our estimates for the full sample. The time spent by females either in the formal market or household production is

insensitive to their absolute wage levels. This could imply to some degree that, with higher earnings, women substitute purchased goods and services, cut back on domestic work and afford more leisure. Surprisingly, we find a significant relationship between domestic work and absolute wages for the subsample of employed males. This reveals a concave domestic labor supply-absolute wage profile. Men in the higher end of the wage distribution also tend to substitute higher earnings for less work at home.

Again, the presence of young children significantly affects the time allocation of women – reduction of hours from the formal market and increase in the time spent for household production. Men also tend to complement their spouses in childrearing and devote more time to household production. However, their market work generally remains unaffected by the presence of children and from this, we could infer that married men tend to give up leisure hours when they have young kids.

The results of the decomposition analysis show that there appears to be gender specialization in the distribution of work even when both spouses participate in the formal labor market. Wages and personal attributes only explain about 19 percent of the gender gap in market work and five percent of the gender gap in domestic work. The latter result implies that if women will behave like men toward household production, the gap in domestic work will virtually disappear. Relative to our findings for the full sample of families, gender effects, particularly in domestic work, seem to perpetuate more strongly for dual-earner families.

#### *Non-labor income*

Some studies on household bargaining include non-earned or non-labor income as an indicator of bargaining power. As with labor income, families may not necessarily pool income from other sources and control of these funds may influence the decision over family resources including work time and leisure. Moreover, Schultz (1990) comments that “if non-earned income influences family demand behavior differently, depending on who in the family controls the income, then the preferences for that demand must differ across individuals.” In our case, spouses may differ in their

propensities to purchase goods and services that substitute for household production and thereby alter time allocation on domestic work.

We examine whether the level of non-labor income<sup>16</sup> influences the labor supply behavior of couples, and how it affects the distribution of work between spouses. Unlike earned income, non-labor incomes are not contaminated by price effects (Lancaster and Ray 2002). Therefore we could expect a more straightforward substitution of work for leisure.

Table 10 shows the effects of non-labor income on labor supply. We find that, for both spouses, a higher level of non-labor income is negatively associated with the amount of time spent on market work, although the impact on women's market work is stronger. Participation of males in household production seems insensitive to the level of non-labor income. Together with their behavior in the formal market, it implies that men gain extra time for leisure given a looser budget constraint.

We obtain a positive association between women's domestic work and non-labor income although the relationship is only significant at a 10%-level. Van der Lippe and Siegers (1994) note that an increase in non-labor income leads to an increase in the demand for home production. An increase in the market goods necessary for home production tends to be complemented by an increase in time inputs. We also observe that the estimates for the impacts of wages, age group and children are similar to our original results. That is, the relationships we found earlier seem to be stable with respect to the inclusion of non-labor income (though this could reflect the fact that non-labor income is usually a small component of an individual's or a household's total income).

While factoring in non-labor income allows for observed characteristics to better explain the gap in domestic work, its inclusion does not alter the results for the decomposition of the gender gap in market work.

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<sup>16</sup> A measure of non-labor income is obtained by combining the individual's investment income over the financial year (interest income, dividends and royalties, and rent income) with private pension and private transfers.

## 5 Conclusions

The paper analyzes the distribution of work among couples in Australia, particularly the supply of market and domestic labor hours, and examines where such patterns of time allocation arise from. Our results confirm a strong positive association between husbands' earnings capacities and their participation in the formal labor market. The time contribution of husbands to household production, on the other hand, appears insensitive to changes in their absolute wage. The market work of wives is generally less responsive to changes in earnings capacity. We observe that low earners react to increasing wages by increasing their hours of total work – more market work for men and more household production for women – thus, putting a strain to their leisure. On the other hand, high earning individuals translate the increase in wages to more leisure as they cut back on paid work and substitute purchased goods and services for domestic production.

From our results, we venture that the difference in earnings capacities explains some proportion of the observed differential in spousal time allocation. However, most of the work gaps are accounted for by structural differences in labor supply behaviors of partners. Social norms or gender preferences seem to influence households toward sustaining gender specialization in sectors of work but more especially in domestic work.

Differences in wages tend to be more relevant for immigrant families originating from non-English speaking countries in terms of explaining the division of labor. Convergence of gender wages would produce the greatest effect on work specialization to this particular group. Given that immigrant women from non-English speaking background have high formal qualifications, we could assert the significance of improved returns to such qualifications of immigrant women in narrowing the gender wage gap and in lessening the asymmetry in household work distribution.

Furthermore, we confirm that being a parent, especially of younger children, unambiguously increases the amount of time spent on home production and significantly alters the time allocation decisions of couples. Mothers adjust their time allocation more than fathers do which implies that rearing children remains largely

a women's domain. Finally, we note that gender specialization persists even when both spouses take part in the formal labor market.

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## 6 Tables and Figures

**Table 1a** DESCRIPTIVE STATISTICS  
NATIVE AND IMMIGRANT HOUSEHOLDS

	ALL				AUSTRALIAN-BORN				IMMIGRANTS			
	HUSBANDS		WIVES		HUSBANDS		WIVES		HUSBANDS		WIVES	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Age	45.018	10.350	42.742	10.142	44.559	10.365	42.389	10.139	47.715	9.845	44.817	9.918
YSM									20.865	12.045	20.205	12.53
Education												
Bachelor & up	0.272	0.445	0.268	0.443	0.256	0.436	0.256	0.436	0.367	0.482	0.337	0.473
Year 12 to Diploma	0.512	0.500	0.391	0.488	0.521	0.500	0.389	0.488	0.462	0.499	0.404	0.491
Below Year 12	0.216	0.411	0.341	0.474	0.224	0.417	0.355	0.478	0.171	0.377	0.259	0.439
Employment												
Employed	0.856	0.351	0.653	0.476	0.865	0.342	0.662	0.473	0.804	0.397	0.601	0.49
Full-time	0.784	0.411	0.307	0.461	0.796	0.403	0.305	0.460	0.713	0.453	0.323	0.468
Part-time	0.072	0.258	0.346	0.476	0.068	0.252	0.357	0.479	0.091	0.288	0.278	0.448
Unemployed	0.017	0.130	0.021	0.144	0.015	0.121	0.020	0.139	0.032	0.175	0.031	0.172
Not in the labor force	0.127	0.333	0.326	0.469	0.120	0.326	0.318	0.466	0.165	0.371	0.368	0.483
No of Observations	7633		7633		6523		6523		1110		1110	

NOTE. – Drawn from the HILDA Survey, 2002-2006

**Table 1b** DESCRIPTIVE STATISTICS  
BY IMMIGRANT GROUPS

	MES				OTHER IMMIGRANTS			
	HUSBANDS		WIVES		HUSBANDS		WIVES	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Age	49.442	9.973	47.66	10.077	46.997	9.681	43.323	9.589
YSM	22.667	11.539	23.872	12.294	19.029	11.701	17.215	11.273
Education								
Bachelor & up	0.268	0.444	0.259	0.439	0.405	0.491	0.373	0.484
Year 12 to Diploma	0.517	0.500	0.396	0.490	0.434	0.496	0.396	0.489
Below Year 12	0.215	0.411	0.346	0.476	0.161	0.368	0.231	0.422
Employment								
Employed	0.841	0.366	0.632	0.483	0.775	0.418	0.557	0.497
Full-time	0.757	0.430	0.321	0.468	0.683	0.466	0.326	0.469
Part-time	0.084	0.278	0.312	0.464	0.091	0.288	0.231	0.422
Unemployed	0.009	0.096	0.022	0.146	0.038	0.191	0.032	0.176
Not in the labor force	0.150	0.357	0.346	0.476	0.187	0.390	0.411	0.492
No of Observations	321		321		657		657	

NOTE. – Main-English Speaking countries are United Kingdom, New Zealand, Canada, USA and South Africa.  
Data drawn from the HILDA Survey, 2002-2006

**Table 2a** DISTRIBUTION OF WORK  
NATIVE AND IMMIGRANT HOUSEHOLDS

	ALL			AUSTRALIAN-BORN			IMMIGRANTS					
	Husbands	Wives	Gap	H-share	Husbands	Wives	Gap	H-share	Husbands	Wives	Gap	H-share
Paid employment	41.87	21.65	20.22 ***	0.69	42.62	21.70	20.93 ***	0.69	37.41	21.34	16.07 ***	0.67
Domestic work	21.58	42.03	-20.46 ***	0.36	21.63	42.49	-20.86 ***	0.36	21.28	39.37	-18.09 ***	0.37
Housework	5.75	19.60	-13.85 ***	0.25	5.72	19.58	-13.85 ***	0.25	5.92	19.73	-13.81 ***	0.26
Errands	3.20	5.20	-2.01 ***	0.38	3.06	5.09	-2.04 ***	0.37	4.03	5.85	-1.82 ***	0.41
Outdoor tasks	6.03	3.27	2.77 ***	0.65	6.12	3.26	2.86 ***	0.66	5.53	3.30	2.23 ***	0.64
Childcare	6.60	13.97	-7.37 ***	0.39	6.73	14.56	-7.83 ***	0.39	5.81	10.49	-4.69 ***	0.42
Total work	63.44	63.68	-0.24	0.50	64.25	64.18	0.07	0.50	58.69	60.71	-2.02 *	0.49
Hourly wage	26.94	23.10	2.98 ***		26.59	23.11	2.37 ***		29.17	23.05	6.98 ***	
No of Observations	7633				6523				1110			

NOTE.- Unweighted sample. \*\*\* (\*\*\*) significant at 1% (5%, 10%). Domestic work is the sum of all household work including childcare. H-share refers to the share of husband's hours to total hours spent by the household on an activity. See Appendix – Table A1 for definition of variables. Source: Author's calculations from HILDA Survey, Period covered 2002-2006

**Table 2b** DISTRIBUTION OF WORK  
BY IMMIGRANT GROUPS

	MES			OTHER IMMIGRANTS		
	Husbands	Wives	Gap	H-share	Husbands	Wives
Paid employment	40.51	21.65	18.86 ***	0.68	35.03	20.66
Domestic work	20.37	36.69	-16.32 ***	0.39	21.57	40.81
Housework	5.89	18.31	-12.42 ***	0.27	6.04	20.42
Errands	3.29	5.17	-1.88 ***	0.41	4.41	6.21
Outdoor tasks	6.49	3.42	3.07 ***	0.66	4.73	3.31
Childcare	4.71	9.80	-5.09 ***	0.39	6.38	10.88
Total work	60.88	58.34	2.54	0.52	56.60	61.47
Hourly wage	34.51	22.24	14.35 **		24.30	21.37
No of Observations	321				657	

NOTE.— See Notes to Table 2a

**Table 3**

DETERMINANTS OF HOUSEHOLD ALLOCATION OF TIME  
Marginal Effects, Full Sample

	MARKET WORK		DOMESTIC WORK	
	Husbands	Wives	Husbands	Wives
Absolute wage	4.948*** (0.327)	0.672 (0.535)	-0.155 (0.206)	1.160** (0.547)
Absolute wage <sup>2</sup>	-0.070*** (0.005)	0.035** (0.013)	0.002 (0.004)	-0.042*** (0.014)
Ln(Relative wage)	-3.173 (1.952)	-5.179*** (1.791)	-3.474*** (1.293)	-6.596*** (1.997)
Age 15 to 24	6.273** (2.519)	2.883 (2.233)	-5.574*** (1.186)	-9.477*** (2.257)
Age 25 to 34	3.260*** (1.058)	0.620 (1.007)	-1.951** (0.787)	-3.897*** (1.339)
Age 45 to 54	-4.086*** (1.098)	-3.492*** (0.970)	-1.586* (0.873)	-2.458** (1.210)
Age 55 to 64	-18.384*** (1.452)	-12.650*** (1.089)	-1.591* (0.868)	-0.466 (1.511)
#children age 0 to 4	-0.188 (0.646)	-11.252*** (0.674)	7.401*** (0.586)	25.126*** (1.035)
#children age 5 to 14	0.269 (0.534)	-2.380*** (0.445)	3.469*** (0.413)	6.346*** (0.623)
#children age 15 to 24	1.052 (0.808)	0.004 (0.544)	-0.056 (0.640)	0.180 (0.706)
#children age 25up	-1.988 (2.172)	-1.904 (1.864)	1.025 (1.377)	3.032* (1.791)
N	7633	7633	7633	7633

NOTES. – Standard errors, which are reported in parentheses, are adjusted to take into account repeated observations and the sampling design of the HILDA Survey. \*\*\* (\*\*, \*) significant at 1% (5%, 10%)

**Table 4**  
DETERMINANTS OF TIME SPENT ON **Market Work**  
Marginal Effects, By Group

	AUSTRALIAN-BORN		IMMIGRANTS		MES		Non-MES	
	Husbands	Wives	Husbands	Wives	Husbands	Wives	Husbands	Wives
Absolute wage	4.375*** (0.351)	0.044 (0.574)	7.293*** (0.769)	2.341 (1.454)	6.290*** (1.889)	2.229 (2.785)	7.129*** (1.019)	2.458 (2.125)
Absolute wage <sup>2</sup>	-0.062*** (0.006)	0.048*** (0.015)	-0.110*** (0.013)	0.002 (0.036)	-0.095*** (0.032)	-0.006 (0.073)	-0.103*** (0.019)	-0.003 (0.052)
Ln(Relative wage)	-2.094 (2.010)	-5.190*** (1.897)	-3.163 (4.877)	-3.226 (4.880)	-6.118 (7.467)	-4.435 (10.169)	-6.203 (6.593)	1.771 (6.322)
Age 15 to 24	7.024*** (2.353)	4.742** (1.888)	8.616 (6.280)	-3.149 (4.959)	5.259 (11.306)	-10.668 (9.494)	8.822 (6.624)	-2.069 (4.867)
Age 25 to 34	3.290*** (1.021)	1.248 (1.060)	3.143 (3.644)	-2.984 (2.868)	-0.615 (5.435)	2.396 (6.334)	6.332 (4.881)	-5.189* (3.125)
Age 45 to 54	-5.003*** (1.229)	-2.955*** (1.055)	-1.186 (2.438)	-5.403** (2.365)	-3.971 (3.651)	-6.424 (3.920)	-0.815 (3.250)	-6.881** (2.963)
Age 55 to 64	-18.882*** (1.608)	-13.166*** (1.114)	-15.673*** (3.402)	-10.860*** (2.805)	-15.469*** (5.486)	-17.780*** (3.863)	-14.695*** (4.407)	-9.967** (3.932)
#children age 0 to 4	0.470 (0.620)	-11.560*** (0.695)	-3.382 (2.135)	-8.426*** (2.069)	2.936 (2.716)	-11.644*** (3.539)	-4.714* (2.582)	-6.861*** (2.354)
#children age 5 to 14	-0.009 (0.570)	-2.199*** (0.477)	2.070 (1.347)	-3.747*** (1.230)	2.999** (1.379)	-4.187* (2.505)	3.002 (1.929)	-3.369** (1.528)
#children age 15 to 24	2.273*** (0.734)	0.331 (0.545)	-2.757 (2.235)	-1.251 (1.516)	5.050* (2.943)	0.923 (3.462)	-2.741 (2.443)	-0.411 (1.708)
#children age 25up	1.108 (2.314)	-1.182 (1.832)	-5.878* (3.325)	-3.883 (3.646)	-2.040 (5.844)	-9.794* (5.458)	-5.170 (3.792)	-2.493 (3.439)
N	6523	6523	1110	1110	321	321	657	657

NOTES. – See Notes to Table 3.



**Table 5**  
DETERMINANTS OF TIME SPENT ON **Domestic Work**  
Marginal Effects, By Group

	AUSTRALIAN-BORN		IMMIGRANTS		MES		NON-MES	
	Husbands	Wives	Husbands	Wives	Husbands	Wives	Husbands	Wives
Absolute wage	-0.305 (0.226)	1.625*** (0.563)	0.303 (0.507)	-0.726 (1.497)	-0.303 (0.713)	-3.050 (2.228)	0.390 (0.668)	0.157 (2.267)
Absolute wage <sup>2</sup>	0.004 (0.004)	-0.056*** (0.014)	-0.004 (0.009)	0.012 (0.038)	0.005 (0.013)	0.060 (0.051)	-0.001 (0.012)	-0.004 (0.057)
Ln(Relative wage)	-2.233 (1.435)	-5.025*** (2.095)	-6.611** (2.756)	-12.058*** (5.237)	-2.169 (3.957)	-3.859 (8.030)	-10.538*** (3.699)	-19.459*** (7.353)
Age 15 to 24	-5.402*** (1.370)	-10.671*** (2.106)	-5.649** (2.569)	-1.767 (6.674)	0.126 (4.009)	-6.202 (6.227)	-7.820*** (2.697)	-0.915 (8.233)
Age 25 to 34	-2.057*** (0.798)	-4.097*** (1.378)	-2.099 (2.453)	-2.888 (3.975)	-7.813*** (2.695)	-9.843 (6.869)	-1.710 (3.089)	-2.286 (5.259)
Age 45 to 54	-1.702* (1.008)	-2.216* (1.272)	-0.613 (1.458)	-3.644 (3.267)	1.269 (3.173)	-6.610 (5.411)	-1.685 (1.807)	-1.145 (4.435)
Age 55 to 64	-2.008** (0.918)	-0.608 (1.590)	0.279 (2.092)	-0.280 (3.962)	-0.122 (3.268)	-0.261 (6.865)	-0.070 (2.682)	-1.344 (5.516)
#children age 0 to 4	7.919*** (0.594)	26.706*** (1.055)	5.199*** (1.642)	15.373*** (2.817)	5.866*** (1.964)	24.129*** (4.015)	4.897** (2.091)	11.312*** (3.359)
#children age 5 to 14	3.715*** (0.449)	6.264*** (0.643)	2.002** (0.851)	7.441*** (1.961)	2.401** (1.174)	9.202*** (3.462)	1.996* (1.150)	6.460*** (2.469)
#children age 15 to 24	0.459 (0.715)	-0.007 (0.685)	-2.080* (1.193)	1.125 (2.142)	-1.003 (1.346)	-0.838 (2.407)	-2.036 (1.363)	0.059 (2.521)
#children age 25up	-0.438 (1.663)	0.712 (1.861)	2.554 (2.239)	7.200** (3.007)	-0.421 (4.229)	3.006 (4.922)	2.562 (2.489)	7.212** (3.048)
N	6523	6523	1110	1110	321	321	657	657

NOTES. – See Notes to Table 3.

**Table 6**  
DECOMPOSITION OF MARKET AND DOMESTIC WORK GAPS

	MARKET WORK			DOMESTIC WORK		
	FULL SAMPLE	AUS- BORN	IMMIGRANTS MES Others	FULL SAMPLE	AUS- BORN	IMMIGRANTS MES Others
Raw differential ( $\hat{\Delta}$ ) s.e.	19.90*** 0.382	20.82*** 0.384	19.75*** 2.240	14.26*** 1.413	-20.51*** 0.574	-18.72*** 1.782
Explained part s.e. in % of $\hat{\Delta}$	6.20*** 0.570 31	5.78*** 0.632 28	8.75*** 3.180 44	6.04*** 2.335 42	-3.66*** 0.469 18	-3.51*** 1.786 19
Unexplained part s.e. in % of $\hat{\Delta}$	13.71*** 0.655 69	15.03*** 0.752 72	11.00*** 3.810 56	8.21*** 2.314 58	-16.85*** 0.694 82	-7.22*** 2.597 81
						-14.37*** 1.848 73

NOTE. – Bootstrapped standard errors (50 replications). \*\*\* (\*\*, \*) significant at 1% (5%, 10%)

**Table 7**  
COUPLES WITHOUT CHILDREN AND COUPLES WITH DEPENDENT CHILDREN:  
DETERMINANTS OF HOUSEHOLD ALLOCATION OF TIME

	COUPLES WITH YOUNG KIDS <sup>†</sup>				COUPLES WITHOUT KIDS <sup>†</sup>			
	MARKET WORK		DOMESTIC WORK		MARKET WORK		DOMESTIC WORK	
	Husbands	Wives	Husbands	Wives	Husbands	Wives	Husbands	Wives
Absolute wage	2.923*** (0.427)	-2.751*** (0.775)	0.093 (0.348)	4.187*** (1.115)	5.947*** (0.678)	3.821*** (0.816)	-0.117 (0.325)	-1.251** (0.528)
Absolute wage <sup>2</sup>	-0.041*** (0.006)	0.107*** (0.020)	-0.001 (0.006)	-0.110*** (0.029)	-0.082*** (0.013)	-0.032 (0.020)	0.001 (0.006)	0.016 (0.013)
Ln(Relative wage)	2.180 (2.524)	3.154 (2.332)	-6.274*** (2.286)	-11.329*** (3.531)	-10.389*** (3.123)	-15.842*** (2.961)	-1.223 (1.692)	2.640 (2.214)
Age 15 to 24	-0.623 (4.398)	-6.454 (4.241)	-2.802 (2.303)	12.030** (5.651)	14.631*** (3.558)	7.120** (2.767)	-4.616*** (1.415)	-7.134*** (1.752)
Age 25 to 34	1.725 (1.196)	-6.961*** (0.972)	1.561 (1.253)	12.983*** (1.732)	7.283*** (2.317)	4.408* (2.359)	-3.339*** (1.154)	-4.428** (1.837)
Age 45 to 54	-3.641*** (1.322)	-0.630 (1.430)	-4.137*** (1.081)	-5.093** (2.263)	1.737 (2.265)	-1.356 (2.134)	-0.100 (1.240)	1.653 (1.840)
Age 55 to 64	-19.760*** (4.036)	-13.395*** (3.058)	-3.108 (2.176)	-4.918 (6.954)	-12.426*** (2.453)	-11.222*** (2.102)	0.587 (1.343)	6.506*** (1.909)
N	3971	3971	3971	3971	2436	2436	2436	2436

NOTES – <sup>†</sup>Couples with kids 15 years old or younger. For the purpose of stark comparison, we excluded couples with children older than 15 years.

Table 8

COUPLES WITH AND WITHOUT DEPENDENT CHILDREN:  
DECOMPOSITION OF MARKET AND DOMESTIC WORK GAPS

	COUPLES WITH YOUNG KIDS		COUPLES WITHOUT KIDS	
	Market Work	Domestic Work	Market Work	Domestic Work
Raw differential ( $\hat{\Delta}$ )	27.41 ***	-29.36 ***	10.65 ***	-8.98 ***
s.e.	0.544	0.619	0.785	0.457
Explained part	6.62 ***	-6.40 ***	4.23 ***	-1.44 ***
s.e.	0.961	0.841	0.765	0.337
in % of $\hat{\Delta}$	24.15	22	40	16
Unexplained part	20.79 ***	-22.96 ***	6.42 ***	-7.55 ***
s.e.	1.241	1.069	0.803	0.502
in % of $\hat{\Delta}$	76	78	60	87

NOTE. – Bootstrapped standard errors (50 replications). \*\*\* (\*\*, \*) significant at 1% (5%, 10%)

Table 9

DUAL-EARNER HOUSEHOLDS:  
DETERMINANTS OF HOUSEHOLD ALLOCATION OF TIME, OLS

	MARKET WORK		DOMESTIC WORK	
	Husbands	Wives	Husbands	Wives
Absolute wage	0.919*** (0.253)	0.088 (0.369)	0.606*** (0.226)	-0.405 (0.549)
Absolute wage <sup>2</sup>	-0.013*** (0.004)	0.020** (0.009)	-0.010*** (0.004)	0.002 (0.013)
Ln(Relative wage)	2.805** (1.251)	9.125*** (1.532)	-2.552* (1.433)	-3.300 (2.113)
Age 15 to 24	-3.373 (2.900)	0.040 (3.092)	-4.460*** (1.505)	-10.428*** (1.766)
Age 25 to 34	0.981 (0.729)	0.366 (0.832)	-1.635* (0.902)	-3.975*** (1.422)
Age 45 to 54	-1.311* (0.745)	-1.847** (0.778)	-1.541** (0.750)	-1.276 (1.166)
Age 55 to 64	-3.505*** (1.162)	-5.539*** (2.006)	-2.424** (1.008)	-2.110 (1.669)
#children age 0 to 4	0.289 (0.508)	-7.998*** (0.678)	10.166*** (0.714)	27.332*** (1.149)
#children age 5 to 14	0.379 (0.366)	-2.875*** (0.360)	3.876*** (0.396)	6.884*** (0.607)
#children age 15 to 24	0.891** (0.402)	-0.866** (0.428)	0.057 (0.428)	1.042* (0.623)
#children age 25up	1.450 (1.420)	-2.110 (1.898)	-1.434 (1.074)	3.077* (1.640)
Constant	34.867*** (3.480)	32.882*** (3.972)	9.806*** (3.027)	31.731*** (5.685)
R-squared	0.051	0.262	0.183	0.372
N	4629	4629	4629	4629

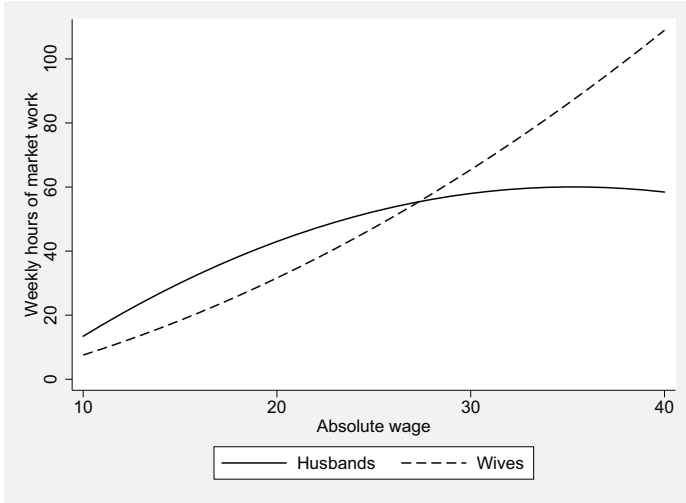
NOTES. – See notes to Table 3.

**Table 10** NON-LABOR INCOME AND TIME ALLOCATION, Full Sample, Marginal Effects

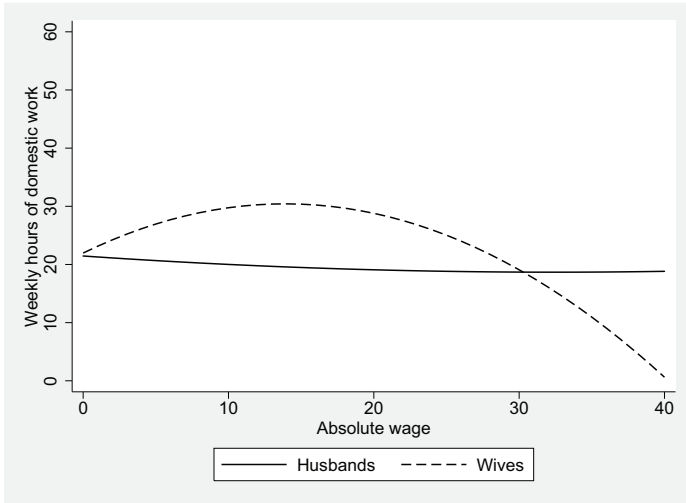
	ALL HOUSEHOLDS				HOUSEHOLDS WITH NLI>0			
	MARKET WORK		DOMESTIC WORK		MARKET WORK		DOMESTIC WORK	
	Husbands	Wives	Husbands	Wives	Husbands	Wives	Husbands	Wives
Absolute wage	4.946*** (0.325)	0.684 (0.532)	-0.155 (0.206)	1.158** (0.547)	4.255*** (0.402)	0.626 (0.674)	-0.021 (0.237)	0.077 (0.760)
Absolute wage <sup>2</sup>	-0.070*** (0.005)	0.035*** (0.013)	0.002 (0.004)	-0.042*** (0.014)	-0.058*** (0.006)	0.034** (0.016)	0.000 (0.004)	-0.019 (0.019)
Ln(Relative wage)	-3.256* (1.942)	-5.370*** (1.793)	-3.490*** (1.294)	-6.507*** (1.997)	-4.160 (2.573)	-2.125 (2.320)	-2.991* (1.557)	-1.355 (2.669)
Non-labor income/100	-0.008** (0.004)	-0.014*** (0.003)	-0.001 (0.001)	0.006* (0.003)	-0.008** (0.004)	-0.017*** (0.004)	-0.001 (0.001)	0.004 (0.003)
Age 15 to 24	6.165** (2.519)	2.629 (2.221)	-5.588*** (1.187)	-9.377*** (2.258)	5.242 (4.052)	8.011*** (2.910)	-4.778* (2.780)	-14.814*** (2.322)
Age 25 to 34	3.147*** (1.063)	0.398 (1.008)	-1.969** (0.787)	-3.796*** (1.339)	2.820** (1.314)	-0.457 (1.399)	-2.853*** (0.926)	-2.534 (2.005)
Age 45 to 54	-3.981*** (1.099)	-3.374*** (0.970)	-1.569* (0.872)	-2.513** (1.209)	-5.313*** (1.177)	-3.124*** (1.202)	-0.581 (0.848)	-4.283*** (1.529)
Age 55 to 64	-17.756*** (1.475)	-12.300*** (1.083)	-1.482* (0.868)	-0.695 (1.523)	-19.322*** (1.813)	-14.923*** (1.299)	0.226 (1.102)	-1.231 (1.989)
#children age 0 to 4	-0.144 (0.649)	-11.159*** (0.673)	7.409*** (0.586)	25.086*** (1.036)	0.972 (0.838)	-11.938*** (0.927)	7.884*** (0.687)	26.710*** (1.729)
#children age 5 to 14	0.276 (0.534)	-2.362*** (0.445)	3.470*** (0.413)	6.340*** (0.624)	1.215** (0.574)	-1.992*** (0.599)	3.186*** (0.407)	6.196*** (0.872)
#children age 15 to 24	1.072 (0.797)	-0.022 (0.542)	-0.054 (0.639)	0.197 (0.705)	2.469** (1.009)	-0.154 (0.621)	-0.534 (0.515)	1.782** (0.752)
#children age 25up	-2.151 (2.172)	-2.061 (1.855)	1.000 (1.373)	3.107* (1.791)	0.907 (2.315)	0.418 (2.150)	-1.648 (1.022)	3.384** (1.676)
N	7633	7633	7633	7633	3777	3488	3777	3488

## ABSOLUTE WAGE AND TIME ALLOCATION OF COUPLES

**Figure 1: MARKET WORK**



**Figure 2: DOMESTIC WORK**



NOTES.- For illustration, figures are based on an individual aged between 35 and 44, without a child and with relative wage equal to 1.

# Appendix

**Table A1**

DEFINITION OF SELECT VARIABLES

Variable	Description
Market work	Number of hours an individual spends in a typical week on paid employment including travel time to and from work
Domestic work	Number of hours an individual spends in a typical week on unpaid activities at home including housework, errands, outdoor tasks and childcare
Housework	Activities such as preparing meals, washing dishes, cleaning house, etc <sup>†</sup>
Household errands	Activities such as shopping, banking, paying bills, keeping records (but do not include driving children to school and other activities) <sup>†</sup>
Outdoor tasks	Activities such as home maintenance (repairs, improvements, painting, etc) car maintenance or repairs and gardening <sup>†</sup>
Childcare	Playing with <i>own</i> children, helping them with personal care, teaching, coaching or actively supervising them, getting them to child care, school and other activities <sup>†</sup>
Absolute wage	The potential full-time wage an individual could receive based on his or her observable characteristics. Prediction techniques are elaborated in Section 3.
Ln (Relative wage)	The potential full-time wage of the individual relative to that of his or her spouse (in log).
Non-labor income	Income earned from investments (interest income, dividends and royalties, rent income) plus private pensions and private transfers.
MES-Immigrants	Immigrants coming from Main-English Speaking countries which refer to United Kingdom, New Zealand, Canada, USA and South Africa <sup>‡</sup>
Other Immigrants	Immigrants other than those coming from Main-English Speaking countries

NOTE.— <sup>†</sup>HILDA Survey Self-Completion Questionnaire, <sup>‡</sup>HILDA Online Data Dictionary (2008).



**Table A2** ESTIMATES FROM WAGE EQUATIONS USED IN PREDICTING WAGES

	HUSBANDS		WIVES	
	OLS	25th Percentile	OLS	25th Percentile
Age	0.040*** (0.009)	0.042*** (0.007)	0.039*** (0.012)	0.035*** (0.006)
Main English Speaking	-0.050 (0.053)	-0.042 (0.033)	-0.085 (0.073)	-0.149*** (0.036)
Other Immigrants	-0.173*** (0.043)	-0.145*** (0.034)	-0.144*** (0.049)	-0.144*** (0.028)
Years since migration	0.002 (0.002)	0.003** (0.001)	0.003 (0.002)	0.003*** (0.001)
HS	0.091** (0.040)	0.046* (0.027)	0.123*** (0.040)	0.053** (0.022)
Cert Diploma	0.090*** (0.025)	0.087*** (0.019)	0.103*** (0.037)	0.029 (0.020)
Bachelor	0.294*** (0.036)	0.232*** (0.024)	0.331*** (0.043)	0.263*** (0.022)
Postgrad	0.407*** (0.037)	0.362*** (0.026)	0.351*** (0.047)	0.293*** (0.024)
Longterm health cond	-0.027 (0.021)	-0.022 (0.019)	-0.112*** (0.028)	-0.109*** (0.018)
Victoria	-0.004 (0.027)	-0.022 (0.018)	-0.050* (0.029)	-0.041** (0.017)
Queensland	-0.065** (0.027)	-0.042** (0.019)	-0.093*** (0.033)	-0.092*** (0.018)
South Aus	-0.047 (0.041)	-0.020 (0.025)	-0.097** (0.042)	0.023 (0.026)
Western Aus	0.036 (0.034)	0.010 (0.023)	-0.048 (0.044)	-0.066** (0.029)
Tasmania	0.006 (0.052)	0.054 (0.040)	0.031 (0.088)	-0.060 (0.042)
Northern Territory	0.192 (0.123)	0.268*** (0.075)	0.064 (0.239)	-0.192*** (0.059)
Aus Capital Territory	0.105** (0.046)	0.101*** (0.038)	0.055 (0.108)	0.093** (0.040)
Other Urban	-0.122*** (0.023)	-0.100*** (0.017)	-0.079** (0.031)	-0.066*** (0.017)
Bounded Locality	-0.027 (0.062)	-0.003 (0.037)	-0.001 (0.054)	-0.011 (0.041)
Rural	-0.198*** (0.036)	-0.171*** (0.020)	-0.028 (0.040)	0.023 (0.020)
#children age 0 to 4	0.020 (0.015)	0.017 (0.011)	-0.012 (0.031)	-0.017 (0.016)
#children age 5 to 14	0.003 (0.010)	0.002 (0.008)	-0.035** (0.015)	-0.024*** (0.008)
#children age 15 to 24	-0.013 (0.018)	-0.022** (0.010)	-0.001 (0.019)	-0.008 (0.009)
#children age 25up	0.041 (0.043)	-0.033 (0.035)	0.061*** (0.031)	0.060*** (0.028)
Constant	2.077*** (0.189)	1.836*** (0.140)	2.055*** (0.240)	2.064*** (0.121)
R squared	0.242		0.292	
N	5986	5969	2347	2342

NOTES. – See Notes to Table 3. The regression further includes industry and time dummies.