# Coordinated Work Schedules and the Gender Wage Gap

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**Abstract**

Using time diary data we construct occupation-level measures of coordinated work schedules based on the concentration of hours worked during peak hours of the day. While men and single women receive a wage premium in occupations with coordinated schedules, married women with children less so, suggesting that temporal constraints related to household care responsibilities restrict their choices. Calibration of a model with these elements generates a gender wage gap of 6.1 percent or approximately 27 percent of the wage gap observed among married men and women with children. If the need for coordination were to drop to the level of "Health Care Support"– an occupation with relatively low coordination, the gender gap due to women's higher demand for household time falls to 2.3%.

*Key words:* Occupations, Coordination, Work Schedules, Time Use, Gender Wage Gap.

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# 1 Introduction

Women have made remarkable gains in the labor market over the past five decades but the rate of convergence in female and male earnings has stalled since 2000. The slowdown appears to be even greater among highly educated women. Goldin (2014) suggests that much of the remaining gap can be explained by the lack of flexible work arrangements. She points in particular to jobs which demand long hours. Since women typically have more household responsibilities related to household and child care, they are both less likely to sort into these jobs and are penalized when they do work in these jobs. Other papers have also shown that the gender gap is particularly large in jobs with high returns to working long hours (Gicheva (2013) Cha and Weeden (2014), Cortes and Pan (2016b), Cortes and Pan (2016a), and Erosa, Fuster, Kambourov, and Rogerson (2017)).

This paper examines the impact of work schedules on the gender wage gap but rather than focusing on the number of hours, we turn attention to the *timing of work*, and the extent to which it conflicts with the demands of family time. Using the American Time Use Survey (ATUS) for 2003-2014, we first document novel facts regarding patterns of daily time use for men and women. We find that among full time workers, married women with children work less relative to their male counterparts according to time-diary data. These "missing hours" occur throughout the day. Women also correspondingly do more household care (child care plus adult care) throughout the day. These patterns suggest that married women with children have demands for home production which limits their flexibility in terms of when they can supply hours of work during the day.

The time diary data also allows us to construct occupation-level measures of coordinated work schedules based on the concentration of hours worked during peak hours. We compute for each occupation the ratio of hours worked between 8 to 5 relative to total hours worked, $ratio8to5$. Given our intuition that individuals with more

care responsibilities would prefer fewer restrictions in terms of when they work, we interpret occupations with higher *ratio*8*to*5 as those offering less temporal flexibility.[1] We compute this ratio for 94 different occupations and we find substantial variation across occupations.

Among the more educated occupations the ones that require more coordination are "Lawyers, law clerks" and "Computer/software related". The ones that show more flexible schedules or that require less coordination are "Writers, authors, and news media" and "Physicians, therapists, nurses, dentists". Among the less educated occupations "Nursing, Psychiatric, and Home Health Aides" and "Cashiers, clerks, retail persons" do not require coordination whereas "Secretaries and Administrative Assistants" is one of the most coordinated occupations. We also examined the extent to which our measure of concentrated work day, *ratio*8*to*5, correlates with other occupational characteristics reported in the O*NET database. We find that our measure is positively correlated with characteristics such as "face to face discussions,""developing and building teams,"and "establishing and maintaining interpersonal relationships."

We use our measure of coordination to investigate how it correlates with earnings, and how it impacts the gender wage gap. For that purpose we use the larger samples of the Current Population Surveys (CPS) and regress individual earnings on our occupational-level measure of flexibility controlling for observed individual characteristics. Individuals (men and women) working in occupations (one standard deviation higher) that require coordination earn approximately 10 percent higher wages. Women who work in coordinated occupations are paid a higher wage but relatively less than men (about 4 percent). Interestingly, if we focus the analysis on single men

[1]One might argue that working parents may prefer an 8 to 5 schedule given the availability of day care centers. However, Stewart (2010) shows that while married mothers who work full-time spend less time in "routine child care" they spend equal time in "other child care" which includes "organization and planning for household children, attending household children's events, picking up/dropping off household children, meetings and school conferences of household children, obtaining medical care for household children, travel related to caring for and helping household children," much of which takes place during the day.

and women, we find no penalty for women associated with coordination, while the penalty is stronger among married men and women with children. Moreover, men who have lower relative earnings than their wives also bear a earnings penalty.

How much does the demand for family time which differentially affect men and women impact the gender wage gap? To complement our reduced-form analysis, we build a model with the essential elements suggested by our empirical work. Married women and men with children have differential demands for household time. There is imperfect substitutability of home production across hours of the day. Productivity losses associated with "missing hours" vary across occupations with some imposing a higher penalty for missing hours than others.

More specifically, in our model individuals obtain utility from consumption of market goods and home goods, the former which is obtained in competitive markets and the latter which is produced at home. Men and women differ in their preference for home goods and we assume that women derive more utility from home goods relative to men. Time is divided into two periods, "8 to 5" period which we call "prime time" and the "post 5" period which we call "home time." Occupations differ in workers' productivity during "prime time" and during "home time". There are some occupations in which workers' productivity is barely affected by the time of day. In other occupations, workers' productivity is much lower during "home time". The occupational choice decision of workers depends on tastes and on possibility of balancing working time during the "prime time" and "home time". In addition, preferences for home goods affect the allocation of time and thus will also affect occupational choice. Individuals who end up working during "prime time" have higher earnings and since women have a higher preference for home goods relative to men, everything else equal, they will work less during "prime time" and have lower wages. The model endogenously generates how concentrated hours are across occupations as well as the distribution of earnings across gender and occupations.

We parameterize the model using the data used in the empirical analysis for mar-

ried men and women with children who are full time workers and compute the *ratio8to5* predicted by the model for each occupation. The only assumed difference between males and females is a lower preference for home care for males. We discipline this difference in preferences using data on hours of work supplied by males and females. The model predicts a positive correlation between the 8*to*5*ratio* and earnings. Most importantly the model produces a gender wage gap that rises with the 8*to*5*ratio*. In other words, women earn a premium in more concentrated occupations, but proportionally less than men. We then use the model to perform a set of counterfactual exercises. Calibration of the model generates a gender wage gap of 6.1 percent suggesting that up to 27 percent of the gender gap can be explained by women's higher demand for household time. If the need for coordinated schedules were to drop to the level of a relatively flexible occupation such as "Healthcare Support," the gender wage gap in the model falls to 2.3%.

This paper contributes to several areas of research. A large literature in labor and macroeconomics examines the role of frictions on workers' labor supply responses. These frictions could arise from fixed wage-hours packages offered by employers which result in non-linear payment schedules. Important contributions are Rosen (1976), Blundell, Brewer, and Francesconi (2008), Altonji and Paxson (1988) and Altonji and Paxson (1992), as well as Prescott, Rogerson, and Wallenius (2009), and Rogerson and Wallenius (2009). Recent papers have emphasized the role of coordination as the driving force behind non-convex budget sets. The wage-hours combinations available to workers may be sparse due to the needs for coordination. This need for coordination could exist at the firm level or even at a more aggregate, economy wide level. Recent papers show that depending on the nature of the shock, and the point on the non-linear payment schedule, labor supply responses could be larger or smaller than would be predicted with linear payment schedules and absence of coordination (Chetty, Friedman, Olsen, and Pistaferri (2011); Rogerson (2011); Labanca and Pozzoli (2018)). We contribute to this literature by exploring how coordination requirements

influence labor supply responses along another important dimension–occupational choice. Instead of examining labor supply responses to tax changes, we focus on the impact on the gender wage gap.

Our work is most closely related to the afore-mentioned papers relating the returns to long hours and the gender wage gap. The non-convex wage schedule with respect to long hours is motivated differently in various papers. Our work explicitly focuses on the need for coordination across workers and the compensating wage premium it generates. One important difference of our measure is that instead of focusing on the number of hours, our measure introduces coordination along the temporal dimension using time diary data.[2] We show that the two measures– long hours and concentration of work time during the day–are positively correlated but the correlation is far from perfect. In other words, the penalty for "missing hours" exists even when we control for long hours.

# 2 Time Allocation by Gender, and Coordinated Work Schedules

## 2.1 Data

We base our analysis on the 2003-2014 American Time Use Surveys (ATUS). One respondent per household is drawn from the Current Population Survey samples and the interviews are conducted approximately three months after the last CPS interview. Time diary information over the previous day is recorded and respondents report their activities and starting and ending times. There are 17 aggregate activities and we focus on two activities, "work and work-related activities" and "caring for and helping household members". For each individual we calculate minutes spent

[2]Other papers which also explore coordination along the temporal dimension are Eden (2017) who introduces a theory for coordination pattern along days of the week. We typically observe–five days of work and two days of rest.Cardoso, Hamermesh, and Varejao (2012) explores patterns of firms' demand for labor across hours of day and days of the week.

on these activities by each hour of the day using information on starting and ending times. We restrict our sample to adults who are 18 to 65 years old. For examining patterns of time allocation by gender, work status, marital and parental status, we include all individuals in this age range in the analysis. To construct ratio of hours worked in the 8 to 5 time interval at the occupation level we include only full-time workers who worked a minimum of 35 hours. Our main sample of time-diary respondents consist of 106,619 observations. The full-time worker sample consists of 66,022 observations. For the regression analysis where we explore the impact of occupation-level $8to5ratio$ on wages, we include all individuals in the CPS, including those who are not time-use survey respondents. For this the sample sizes are considerably larger, with the sample consisting of 287,072 individuals who are full-time workers aged 18 to 65. Since the time use surveys are conducted 3 months after the main CPS interviews we use variables such as age and work status that are collected at the time of the time use survey whenever possible. Some of the information, however, such as education, is available only in the main CPS data.

## 2.2 Timing of Work and Household Care

In this section we describe patterns of time use over the course of a single day for full-time workers by gender, marital status and parental status. These patterns show how time allocated to market work are constrained by demands of family time and how those constraints differ for men and women. Figure 1 explores *when* work happens. The picture graphs the average number of minutes worked by one-hour time bin for full-time workers. The figure shows that most (74 percent) of work occurs during the time interval 8 to 5 with a break during the interval 12 to 1 p.m. Even among full-time workers, average minutes worked per hour is well below 60 which may reflect the fact that we are averaging over all 7 days of the week including weekends. Figure 2 graphs the average number of minutes worked by marital and parental status. The top panel shows work for married individuals, men and women, with at least one

own child in the household, who work full-time. The bottom panel shows work for singles with no children. Even among full-time workers, women work less than men, with the gap being largest among those married with children. Table 1 explores the gender differences in work further for this group. The table shows that women work approximate 0.9 hours less on weekdays and 0.7 hours less on weekends. Column (5) controls for usual weekly hours worked reported on the activity summary file. Column (6) only includes workers who reported usual weekly hours less than 50. Both of these restrictions reduce the gap in hours worked but even among fulltime workers who work less than 50 hours, married women with children work almost 0.5 hours less on weekdays relative to their male counterparts. However, the "missing hours" among women occur throughout the day and does not appear to have, at least among full-time workers, a notable temporal pattern.

Figure 3 graphs the temporal pattern of household care among full time workers who are married with children and singles without children.[3] The differences in the temporal pattern of work and household care, however, is notable. Both women and men with children report household care with noticeable bumps up in the early morning and evening hours. The temporal pattern of care for full-time workers with children are negatively related to the temporal pattern of work, with the least number of minutes devoted to care activities during the 8 to 5 interval. Even during the 8 to 5 interval, household care does not fall to zero however. Table 2 shows that among married men and women with children, women engage in nearly 0.5 hours more household care during weekdays and 0.3 hours more on weekends. Different controls reduce the gap but the table shows that women significantly allocate more time to household care than men.

[3]Household care includes active child care and elder care where respondents report these activities as the primary activity. We do not include passive child care where it is reported as a secondary activity.

## 2.3 Measure of Coordinated Work Schedules

Building on the insight from the previous section, we build our measure of coordinated work schedules for different occupations. Call the time intervals between 12 a.m. and 8 a.m., between 8 a.m. and 5 p.m. and, between 5 p.m. and 12 a.m. A, B and C, respectively. $A_{ij}$, $B_{ij}$, and $C_{ij}$ then refer to the sum of minutes worked by individual $i$ in occupation $j$ in those respective intervals. We sum over individuals to get occupation-level equivalents where $w_i$ refers to the survey weight of the individual.

$$A_j = \sum_{i=1}^{N_j} w_i A_{ij}, B_j = \sum_{i=1}^{N_j} w_i B_{ij}, C_j = \sum_{i=1}^{N_j} w_i C_{ij}$$

Our measure of coordinated work schedules at the occupation level is the ratio of minutes worked in the 8 to 5 interval relative to total minutes worked.

$$ratio8to5_j = \frac{B_j}{A_j + B_j + C_j}.$$

We include only full-time workers in calculating this ratio. A higher ratio indicates that a greater amount of work in the occupation occurs during the standard 8 to 5 work day. We also standardize this measure by subtracting the mean and dividing by the standard deviation. We view a higher ratio as indicating less flexibility vis a vis working parents given they have greater care responsibilities, some of which occur during peak hours.

Tables 3 and 4 report the occupation level ratios for 94 different occupation categories sorted from low to high ratios. Table 3 examines less educated occupations where the share of workers with a college degree is less than 0.4. Table 4 examines educated occupations.[4] We highlight some well-known occupations in Figure 4. Among occupations with relatively educated workers "Lawyers, law clerks" and "Financial Analyst" have standardized ratios of 0.824 and 1.03, respectively. "Com-

[4]We mapped detailed 2002 Census occupation codes to detailed Standard Occupation Classification (SOC) codes and aggregated to 94 SOC categories.

puter/software related" occupations have a standardized ratio of 0.759 and "Writers, authors, and new media" have a relatively low ratio equal to 0.485. "Physicians, therapists, nurses, dentists" have the lowest ratios at -0.274. In occupations with relatively less educated workers "Nursing, Psychiatric, and Home Health Aides" has a very low ratio of -1.638. "Cashiers, clerks, retail persons" have a ratio of -0.133. Occupations with relatively high ratios are "First-Line Supervisors of Retail , non retail Sales Workers" (0.534) and "Computer Operators" (0.964), and "Secretaries and Administrative Assistants" (1.434).

Table 5 reports correlations of our measure of coordinated work schedules, *ratio8to5*, with other occupational characteristics reported in the O*NET data base.[5] The table shows that our measure points to the need for coordination with others in the workplace. Our measure is positively correlated with "developing and building teams," "establishing and maintaining interpersonal relationships," and "face to face discussions." On the other hand, it is negatively correlated with "assisting and caring for others."

One can view this measure a rather arbitrary way to think about the concentration of working hours during a day as the fraction of 8 to 5 is fixed. As an alternative one could think of how concentrated the hours are during the day without pre-establishing the times of the day. In the following we provide an alternative measure of the concentration based on the Herfindahl index.

Let $work_j^k$ be the total weighted time spent working in each day of the week-hour time bin $k$ in occupation $j$,

$$work_j^k = \sum_{i=1}^{N_j} work_{ijk}.w_i$$

where $i$ denotes individual in occupation $j$ and $w_i$ denotes weight of individual i.

[5]O*NET defines the importance of occupational characteristics for detailed SOC occupations. We aggregate the indexes to our 94 occupations by taking a weighted average where the weights are the total number of workers in each detailed SOC occupation.

Let $share_j^k$ be the fraction of the total time spent in each occupation in each time bin and each day.

$$share_j^k = \frac{work_j^k}{\sum_k work_j^k}$$

Our Concentration Index measure is the Herfindahl index defined as:

$$cr_j = \sum_k (share_j^k)^2$$

Table A.3 in the appendix shows regression results using this alternative measure with very similar qualitative results as the $ratio8to5$.

# 3 Coordinated Work Schedules and the Gender Wage Gap

In this section we analyze how our measure of coordinated work schedules is priced in the labor market, and how it impacts the gender wage gap. Specifically, we estimate the following regression at the individual level:

$$lnW_i = \beta_0 + \beta_1 * female_i + \beta_2 ratio8to5_j + \beta_3 female_i * ratio8to5_j + \beta_4 X_i + \varepsilon_i \quad (1)$$

where $lnW_i$ is the log of individual weekly earnings, $female_i$ is the female dummy, $ratio8to5_j$ is ratio of hours worked in the 8 to 5 interval which varies at the occupation level $j$, $X_i$ are other observable characteristics including a quartic function in age, race, and education dummies. We also control for (log) hours worked last week. Our sample includes only full-time workers. $\beta_1$ measures the impact of the female dummy, $\beta_2$ measures the impact of working in occupations with more concentrated work day,

and $\beta_3$ captures how being female interacts with working in these occupations.

Table 6 reports the results of the regression. The top panel reports the results for all full-time workers. Column (1) presents the baseline results. Women earn on average 22 percent less than men. Individuals in occupations with higher *ratio*8*to*5 earn higher wages, with one standard deviation higher ratio leading to approximately 12 percent higher wages. The interaction term indicates that women suffer about a 5 percent higher penalty in these occupations. In column (2) we control for occupation-level education which reduces the size of the wage premium associated with these occupations and also the female-specific penalty. In column (3) we also control for the fraction of male workers in the occupation who report working more than 50 hours per week– the measure of "overwork" used by Cortes and Pan (2016b). The coefficient on the concentration measure is still significant although the female-specific penalty is no longer significant.

The bottom two panels report results separately by marital and parental status. Panel B reports results for single men and women. Notably the interaction terms are all insignificant pointing to the fact that there is no penalty for women associated with coordinated work schedules. Panel C reports results for married men and women with children. The female interaction terms are larger and significant which suggests that the results pooling over all workers reported in the top panel was largely due to the married with children group.

Appendix A.1 examines results separately for college and non-college workers. Among married men and women with children, the extra wage penalty associated with coordinated schedules for women is larger for college-educated women. However, there is still a similar pattern even among non-college women.

These regressions indicate that workers in occupations where most in the occupation adhere to a standard 8 to 5 schedule are paid a higher wage. However, the gender gap in these occupations is larger. This pattern is particularly pronounced when we restrict our sample to married men and women with children, strongly suggesting

that conflicts related to work and family time play an important role.

One objection to our interpretation of the results is that employers may be practicing statistical discrimination against married women with children and the level of discrimination is particularly severe in occupations with coordinated schedules. This alternative interpretation, while closely related, suggests that it is not necessarily the temporal constraints that women face due to household care responsibilities that are at play. To further investigate this alternative explanation, we examine different groups of married men who are full-time workers. Table 7 reports the results of a regression with similar format as Table 6 but we make comparisons among men only. The sample includes all married men with working spouses. The variable "wifemore" is an indicator equal to 1 if the wife has higher reported weekly earnings. The regression shows that indeed married men who make less than their wives earn 42 percent less than men who earn more than their wives. The coefficient of interest however is the interaction term which indicates that one standard deviation higher ratio leads to a 5 percent higher penalty for these men. Table 7 shows that the phenomenon is not unique to comparisons between men and women only but similar patterns can be found among men. Appendix tables A.4 and A.5 show that married men who make less than spouses work less relative to men who make more than their spouses. They also have very slightly higher household care time.

To complement our reduced-form analysis, in what follows we build a model with the essential elements suggested by our empirical work and conduct counterfactual exercises.

# 4 The Model

**Environment** The economy is populated by a continuum of male and female workers of equal masses which sum to 1. Everyone lives for one period only, and values consumption of a market good, denoted by $c$, and a home good denoted by $h$. People

rank bundles of the two goods according to a Cobb-Douglas utility function:

$$u(c,h) = (c)^{\nu^s}(h)^{1-\nu^s}, \tag{2}$$

where $\nu^s$ represents the weight of market goods in utility for gender $s$ with $s = f, m$. Workers have one unit of time, a fraction of which can be supplied in a labor market that features $J$ occupations and which are labeled using the integer $j$. Occupations are mutually exclusive; workers can only work in one occupation. Workers receive a wage $w_j$ per unit of time they supply in occupation $j$. Earnings from the supply of labor is how workers finance the market good $c$.

Prior to choosing an occupation, each individual draws a taste parameter from occupation by gender-specific distributions. Each individual $i$ can be represented by a vector $\Omega_i$

$$\Omega_i = \left\{\theta_{i,1}, \ldots, \theta_{i,J}\right\}$$

where each value $\theta_{i,j}$ is drawn from a distribution $F(\theta_{j,s})$.

Time is divided into two sub-periods of equal length. We label the first period as "prime" (or 1), and the second period as "home" (or 2). We associate the first period in the model as the 8am to 5pm period in the data.[6] Workers do not exclusively choose how to split their unit of time between working in the market and home care, they also choose how much to allocate to either activity during each sub-period. We denote by $h^i$ and $l^i$, respectively, the home care and work choices in sub-period $t$. Since the total time used must add up to one, the following identity must hold:

$$h^i_{j,1} + l^i_{j,1} + h^i_{j,2} + l^i_{j,2} = 1. \tag{3}$$

Since either sub-period represents half of the total time, the following must also be true:

[6]That our prime period starts at the beginning of the "day", as opposed to the middle (as in the data) is an innocuous assumption. It is convenient and nothing of substance changes.

$$h^i_{j,t} + l^i_{j,t} = 0.5, \tag{4}$$

for each sub-period $t$.

Occupations differ in their degree of coordination of schedules. Coordination in our environment is reflected in a penalty for supplying home care time during the prime period. Postponing work to the second period ("home") implies a large productivity loss in some occupations and almost none in others. A reduced form way of capturing the importance of coordinating workers' schedules is given by a reduction in the effective hours of work when labor is not supplied during prime time:

$$l^i_j = l^i_{j,1} + l^i_{j,2} - (0.5 - l^i_{j,1})^{\alpha_j} \quad with \quad \alpha_j => 0 \quad \text{for} \quad j = 1, ..., J. \tag{5}$$

The parameter $\alpha_j$ drives the penalty for not supplying labor during prime time in occupation $j$. The penalty is large in occupations with a low $\alpha_j$, while in those with a high $\alpha_j$ the loss is minimal. The maximum amount of time any worker (male of female) can work in the prime period is 0.5. For a given amount of work, supplying more home care time during period 1 leads to a lower productivity per hour. The extent of the productivity loss is occupation- but not gender-specific. Although $\alpha$ is exogenous, and thus our model is silent about the source of these differences, one interpretation is that workers coordinate because productivity rises when everyone is present. By convention, this coordination takes place during the period we call prime time.

The production of home goods employs hours both at prime and home time according to a Cobb-Douglas technology:

$$h^i = \left[ (h^i_1)^\rho + (h^i_2)^\rho \right]^{\frac{1}{\rho}}, \tag{6}$$

where $\rho$ is the parameter that governs the elasticity of substitution between the supply of home care time across the two time periods.

On the production side, there is a set of $J$ intermediate goods producers indexed by $j$. We associate the production of an intermediate good with an occupation. Each produces an amount $X_j$ of the intermediate good. Its production employs a linear technology in effective units of labor $N_j$; that is, $X_j = A_j N_j$, where $A_j$ is a total factor productivity parameter.[7] Markets are competitive and the producer faces prices for her good $p_j$ and wages $w_j$.

The producer of intermediate good $j$ solves the following maximization problem:

$$\max_{N_j} p_j X_j - N_j w_j \tag{7}$$

subject to the available technology $X_j = A_j N_j$. The solution to the problem is $p_j = w_j$. Intermediate goods producers sell to a final goods producer. The technology for producing a certain amount $Y$ of the final good from a vector of quantities of intermediate services $\{X_1, \ldots, X_J\}$ is described by,

$$Y = \prod_{j=1}^{J} \left\{ X_j^{\kappa_j} \right\}. \tag{8}$$

with $\sum_{j=1}^{J} \kappa_j = 1$ (Cobb-Douglas).

The final good producer solves the following maximization problem:

$$\max_{\{X_1,\ldots,X_J\}} \prod_{j=1}^{J} \{X_j\}^{\kappa_j} - \sum_{j=1}^{J} p_j X_j. \tag{9}$$

Note that in equilibrium $X_j = N_j$ and $p_j = w_j$, so that this maximization problem implicitly defines labor demand functions $\left\{ N_j = N_j^d(w_j, N_{-j}) \right\}_{j=1}^{J}$

**Individual's Decision Problem** The amount of effective labor supplied by a worker of gender $s$ in occupation $j$ is $l_j^s$. Effective labor is compensated at a rate $w_j$ per unit.

[7] The role of the total factor productivity parameters is only to help deliver the empirical distribution of earnings across occupations. Replicating that distribution is necessary to obtain a plausible gender wage gap.

The value of occupation $j$ for an individual of gender $s$ is,

$$V_j^s(\theta_j^s) = \theta_j^s \left\{ \max_{c^s, l_{j,1}^s, l_{j,2}^s, h_{j,1}^s, h_{j,2}^s} \{u(c^s, h^s)\} \right\} \tag{10}$$

$$s.t. \tag{11}$$

$$c^s = l_j^s w_j \tag{12}$$

$$h_{j,2}^s + l_{j,2}^s = 0.5 \tag{13}$$

$$h_{j,1}^s + l_{j,1}^s + h_{j,2}^s + l_{j,2}^s = 1 \tag{14}$$

$$l_j^s = l_{j,1}^s + l_{j,2}^s - (0.5 - l_{j,1}^s)^{\alpha_j} \quad with \quad \alpha_j \geq 0 \tag{15}$$

$$h_j^s = ((h_{j,1}^s)^\rho + (h_{j,2}^s)^\rho)^{\frac{1}{\rho}} \tag{16}$$

Each individual chooses from a set of $J$ occupations the one that yields the highest utility.

$$\widehat{j^s} = argmax \left\{ W_1^s, \ldots, W_J^s \right\} \tag{17}$$

where $W_{\widehat{j}}^s$ for an individual $i$ of gender $s$ is defined as

$$W_{\widehat{j}}^s = \left\{ V_{\widehat{j}}^s | \Omega_i \right\}. \tag{18}$$

The occupational choice determines an endogenous distribution of male and female workers across occupations. Let $\mu_j^s$ denote the mass of gender $s$ workers in occupation $j$ then, $\sum_{j=1}^J (\mu_j^f + \mu_j^m) = 1$. Define by $\mu_j = \mu_j^f + \mu_j^m$ the size of occupation $j$.

**Aggregation and Equilibrium** Given wages, individuals solve the optimization problem yielding value functions $\left\{ V_j^s \right\}_{j=1}^J$.

For an occupation $j$, its population satisfies $\mu_j^s = Prob(W_j^s > W_{-j}^s)$ where we define the vector $W_{-j}^s$ to be equal to $\left\{ W_1^s, \ldots, W_{j-1}^s, W_{j+1}^s, \ldots, W_J^s \right\}$.

For occupation $j$, the total labor input is defined as,

$$N_j = \frac{\mu_j^m}{\mu_j}(l_{j,1}^m + l_{j,2}^m - (0.5 - l_{j,1}^m)^{\alpha_j}) + \frac{\mu_j^f}{\mu_j}(l_{j,1}^f + l_{j,2}^f - (0.5 - l_{j,1}^f)^{\alpha_j}). \tag{19}$$

In addition, in equilibrium:

$$w_j = \kappa_j N_j^{\kappa_j - 1} \prod_{-j} \left\{ X_{-j}^{\kappa_{-j}} \right\}. \tag{20}$$

Given individual's occupational and hours choices our model predicts *ratio8to5*'s for working hours which we denote as $ratio8to5_{W,j}^s$ for $s = f, m$. Following the definition of these indicators presented above, their model counterparts are given by,

$$ratio8to5_j^s = \frac{l_{j,1}^s}{(l_{j,1}^s + l_{j,2}^s)}. \tag{21}$$

Therefore,

$$ratio8to5_j = \frac{\mu_j^m}{\mu_j} ratio8to5_j^m + \frac{\mu_j^f}{\mu_j} ratio8to5_j^f. \tag{22}$$

Before we take this model to the data and examine the role of coordination frictions in accounting for the gender gap, we illustrate the model's mechanisms using a simpler version than the one described above.

# 5 Model Mechanics in a Simple Case

We restrict attention to an economy with only two occupations. We provide a numerical example choosing illustrative values of the parameters to expose the main mechanisms. We analyze three environments which differ in the degree of heterogeneity among workers. We provide more details below. There is a set of parameters that are common across these economies. Earnings in each occupation represent an

equal share in final aggregate income, i.e $\kappa_1 = \kappa_2 = 0.5$. The parameters that govern the productivity penalty due to the coordination of workers are $\alpha_1 = 0.8$ and $\alpha_2 = 2.8$. In other words, in occupation 1 coordination is important. Table 8 summarizes the results of each of the experiments that are described below.

**Economy 1: Homogeneous Agents without Gender Differences** This economy features a mass of size 1 of workers who have the same weight for market consumption: $\nu_m = \nu_f = 0.8$. The parameter driving the elasticity of substitution between home care time, $\rho$, is set to 0.6. The results are shown in Panel A of Table 8.

Consumption goods and household care are substitutes. More market consumption implies more market time and less time allocated to household care. The equilibrium features sorting into occupations, with a larger mass of workers choosing occupation 2. Because of the higher $\alpha$, productivity losses due to coordination are smaller in occupation 2. As a result, occupation 2 is more attractive. Despite the higher cost, the final goods technology rules out an equilibrium in which no one chooses occupation 1. Wages adjust to leave workers indifferent between the two occupations. The higher wage results in higher supply of labor in occupation 1. Hence, $l_1 + l_2$ is larger. However, they have to pay a higher penalty and as a result effective hours are equal across occupations. To summarize, workers in occupation 1 supply more market work and less household care. The opposite is true in occupation 2. Why is the bunching ratio higher in occupation 1? Because workers, in an attempt to minimize the hours penalty, bunch hours to a larger extent in the prime period. Prime time cannot be exclusively devoted to work, however, because home care cannot be substituted perfectly across the two sub-periods. Finally, since workers in occupation 1 devote relatively more hours to work in "prime" time they end up devoting relatively more hours of household care during "home" time ($h_2$)

**Economy 2: Gender Differences in Household Care Responsibilities** We now consider the case of an economy populated by males and females. Males and females only differ by the weight in market consumption $\nu$. Half of the workers have $\nu = 0.9$ (male) and half have $\nu = 0.7$ (female), i.e. females have stronger preferences for household care. The results are shown in Panel b of Table 8.

Due to their different preferences, females and males do not sort randomly into the two occupations. Females have relatively higher preference for household care and thus they populate mostly occupation 2, the high $\alpha$ occupation. Occupation 2 allows females to supply household care without paying too high an hours penalty. In addition, since household care hours are complementary during the day, more total household care time means a higher supply of household care hours both at prime and home time, i.e. household care hours need to be smoothed during the day. Occupation 2 is the one that allows them to do that at a relatively lower cost. Males have a comparative advantage in occupation 1. Because they want to supply more labor, they downplay the importance of the penalty when choosing their occupation. As a result, a higher proportion of males work in occupation 1.

To summarize, workers in occupation 2 spend a bit more time in home care (because the wage is lower). Consequently, raw hours, effective hours worked, and earnings, are all lower. Therefore, in equilibrium there is a gender gap in earnings of 3%. Much of the gender gap is due to earnings differentials between occupations - occupation 1 is mostly males while 2 is mostly females.

**Economy 3: Gender Differences in Household Care Responsibilities and Taste for Occupations** We now consider the case of economy 2, but we incorporate gender differences in tastes for each occupation which results in 50% of workers being female in each occupation.

Conditional on working on occupation 1, females want to work more than if they are in occupation 2 since they want to minimize the coordination cost. However,

they will work less than males since they want to supply relatively more time to household care. As a result they will end up paying a higher cost in terms of effective hours and thus their earnings per hour are going to be lower than males. That is also the case for males and females in occupation 2, but the effects are lower given that $\alpha$ is higher. For this reason, the gender earnings gap per hour is higher in occupation 1. In equilibrium, this example features a gender gap in earnings per hour of 5% in occupation 1 and no gender earnings gap in occupation 2. The aggregate gender earnings gap for this economy is also 3%. While the aggregate earnings gap is the same as in economy 2, the gender gap in this economy is entirely driven by earnings differences within occupations due to the fact that women have fewer effective hours.[8]

As in the other economies, conditional on being in occupation 1, workers want to supply more time to prime time to minimize the coordination cost, and as in the other cases, the bunching ratio is higher in occupation 1. Therefore, the example reflects the negative correlation between the bunching ratio and the gender earnings gap we find in the empirical part of the paper.

**Economy 4: Changes in the Degree of Substitution of Household Care Time** In Economy 4, we take economy 2 and change the degree of substitution between home care across the two different time periods. We set $\rho = 0.2$. In this case, household care time is less substitutable. The results are shown in Panel D of Table 8.

As in economy 2, females have a relatively higher preferences for household care and thus they populate mostly occupation 2, the high $\alpha$ occupation. In addition, since household care hours are now less substitutable across periods for both males and females, there are more workers in occupation 2 because it allows them to smooth household care at a relatively lower cost. Now household care time needs to be relatively more smoothed and also its counterpart, working time. This explains the

[8]Note that in this particular example the share of workers in each occupation is 50% so all the differences in earnings per hour come from differences in the effective hours and not from differences in the wage rates across occupations.

decreases in the bunching ratio in both occupations and the reduction in effective hours of work. The gender earnings gap is slightly lower than in Economy 2. The reason is that occupation 2, the occupation with lower earnings, is relatively more attractive to males and that reduces the gender gap.

# 6 Quantitative Analysis

To assess the quantitative predictions of the model, we calibrate the model using aggregates from the US labor market. We restrict the analysis to 22 occupations by further aggregating the 94 occupations using cross-walks provided by the SOC codes. We also restrict the sample to married men and women with children in the household. Among other variables of interest, solving the model yields bunching ratios, $ratio8to5$, for work and home care, as well as earnings for men and women in each occupation.

## 6.1 Calibration

We assume that the distribution of tastes is Frechet with a common dispersion parameter.[9] Thus, we assume

$$F() = Prob(\theta \leq \theta_0) = -exp(-T_{j,g}\theta_0)^{-\xi} \tag{23}$$

The calibration chooses values for a total of 113 parameters:

$$\left(\{\alpha_j\}_{j=1}^{22}, \{\kappa_j\}_{j=1}^{22}, \{T_{j,m}\}_{j=1}^{22}, \{T_{j,f}\}_{j=1}^{22}, \{A_j\}_{j=1}^{22}, \rho, \nu^f, \nu^m\right).$$

There are 22 of them that we take directly from the data: the labor shares $\{\kappa_1, ..., \kappa_{22}\}$ which are chosen to match the share of total earnings in each occupation. The rest of the parameter values are chosen to minimize the distance between the moments in

[9] This assumption is typical in discrete choice models and made for tractability.

the data and the ones generated by the model.[10] The moments we pick to match are the following: the bunching ratios, $ratio8to5$, the fraction of females relative to males within an occupation, the fraction of employment in each occupation, and the average earnings per hour, all by occupation; the fraction of working time for males and females; and the ratio of the average bunching ratio of work to the average bunching ratio of home care.[11] Panel A of Table 9 shows the values for the occupation-specific moments we match. Panel B of Table 9 displays the remaining targeted moments. Table 10 shows the model fit by showing the correlation between the targeted moments in the data and in the model. With one exception the table shows that the model fit is good. The parameter values we obtain are shown in Tables 11. The most interesting set of parameters are the $\alpha$'s. Their distribution is rather skewed and their correlation with the bunching ratios is -0.66. In other words, the bunching ratio across occupations is mainly determined by the $\alpha$ but not completely (otherwise the two would be perfectly negatively correlated). The share of females in an occupation plays an important role too. The work bunching ratio of females is higher than that of males, so if an occupation is 90% female (as, it is for example, Healthcare Support) it needs a larger $\alpha$ than an occupation with the same bunching ratio but only 30% females. The skewness is an artifact of coordination costs being virtually zero for a large $\alpha$. There is little information about coordination costs for an $\alpha$ between 50 and 150.

In Table 12 we return to the regressions reported in Section 3 but now comparing results from data and the model. The first column displays the coefficients on the female dummy, the bunching ratio, and the interaction between the two using data.[12]

[10]Because the paper is not concerned with the distribution of tastes within occupations, setting a common dispersion parameter is irrelevant. We could assume either a different common dispersion parameter or a different dispersion parameter by occupation and gender. Doing so would yield different values for the (female) Frechet parameters driving the mean for the model to be consistent with the empirical female shares across occupations.

[11]The value of the last moment is largely influenced by $\rho$. A high value of $\rho$ implies a low home care ratio (little home care takes place during prime time). Because we only model two activities and we normalize the length of each period to be 0.5, the model can't deliver either work or home care bunching ratios in levels. That's the reason for targeting the ratio.

[12]Note that the coefficients will not exactly match those in Table 6 due to the fact that our occupation

The second column shows the analogous coefficients from our model-simulated data. The bunching ratio coefficient is 0.30 in the model and is larger than in the data because there are fewer elements affecting earnings per hour in the model. The coefficient on the interaction between the bunching ratio and the female dummy is -0.05. What drives the positive relationship between the gender gap and the bunching ratio in the model? The coordination cost is higher the lower the $\alpha$, which translates into a higher bunching ratio. Since females supply more home care, and home care is not perfectly substitutable across hours of the day, they supply fewer market hours during the prime period. As a result, they lose hours and their compensation reflects that loss. To summarize, the coefficient values show that the relative penalty suffered by women in high bunching ratio occupations is about the same in the data and the model. The overall premium that both males and females get in high bunching ratio occupations however, appears to be higher in the model.

## 6.2 The Baseline Economy

Solving the model for the set of parameter values delivers an equilibrium that features males and females working in different occupations and making labor supply decisions. As a result, the mechanisms in the model generate a gender wage gap in each occupation and an economy-wide gender wage gap. Table 13 reports the baseline results. The overall gender wage gap is 23% in the data and 6.1% in the baseline model. As mentioned above, this economy-wide gender wage gap can be decomposed into the between and within occupation components. More specifically, let the earnings ratio between males and females for the whole economy be defined as $egap = e_m - e_f$, where $e_m$ and $e_f$ represent the log of the earnings of males and females, respectively. Then,

measure is aggregated to 22 groups.

$$egap = \sum_{j=1}^{J} \left( \gamma_{m,j} e_{m,j} - \gamma_{f,j} e_{f,j} \right), \tag{24}$$

where $\gamma_{m,j}$ and $\gamma_{f,j}$ are the proportions of males and females in occupation $j$ respectively over total males and females in the population. Thus,

$$egap = \sum_{j=1}^{J} (\gamma_{m,j} - \gamma_{f,j}) e_{m,j} + \sum_{j=1}^{J} \gamma_{f,j} (e_{m,j} - e_{f,j}), \tag{25}$$

where $\sum_{j=1}^{J} (\gamma_{m,j} - \gamma_{f,j}) e_{m,j}$ is the between component and $\sum_{j=1}^{J} \gamma_{f,j} (e_{m,j} - e_{f,j})$ is the within component.

As shown in Table 13 the within component is 26.8% while the between component is -3.9% in the data. This is broadly consistent with Goldin (2014) who finds that the bulk of the gender wage gap exists within occupations and only a small component is due to the between portion. The model predicts a within component of 6.5% which accounts for 24% of the within component in the data and 28% of the overall gender gap. The model also generates a between component of -0.4%. In the data, it is -3.9%. The endogenous channel in our model– the interaction between preferences and coordination costs– has implications for the both the within and between components. Although that channel influences mostly the within component it does also affect the between component due to the effect on the sorting of women into occupations. While it explains a substantial component of the within component it does not account for all, indicating that there are other forces in the economy that affect the gender wage gap within an occupation.

## 6.3 Counterfactual Experiments

In this section we conduct counterfactual experiments to asses the the impact of various parameters on the gender wage gap. The key parameters of interest that we focus on are the $\alpha$s which reflect coordination costs, and the $\nu$s which reflect preferences for

consumption and for household care.

### 6.3.1 Coordination of Schedules and the Gender Wage Gap

In this experiment we set all $\alpha$'s to be equal across occupations and set it at a relatively high value of 3.05 which is the value estimated for "Health Care Support." Equating all $\alpha$'s to a large value (reflecting low coordination costs) illustrates the effect of changing this important job characteristic on the gender wage gap. One possible motivation for such an experiment is changing technology such as on-line connections and internet technology which lowers the costs of coordinating with other workers. Since in this experiment women still have a higher preference for household care (higher $\nu$), everything else equal, they will work less and allocate more hours to home production relative to men. However, the costs of doing so will be lowered.

The gender gap falls from 6.1% (baseline) to 2.3%. The within component falls (see the third row of Table 13) from 6.5% to 2.0%. The between component rises from -0.4% to 0.3%. The within occupation gender gap drops substantially due to the fact that the $\alpha$ for "Healthcare Support" is large enough so that the coordination costs are lowered. So despite women's higher preference for household care, setting $\alpha$ to a relatively high value for all occupations makes the within gender wage gap smaller.

Figure 5 shows the within component of the gender gap (vertical axis) when this counterfactual is repeated for different values of $\alpha$ (horizontal axis). Low values of $\alpha$ such as that for "Management," for example, implies a large within component of around 25%) As $\alpha$ becomes larger the coordination costs become negligible and the within occupation gender gap approaches zero. Figure 5 shows that there is little information between moderately high $\alpha$s and very high $\alpha$s– that is, once $\alpha$ reaches a value of 5 and greater, the within-occupation gender gap essentially disappears.

The between component rises we equalize $\alpha$ due to changes in sorting across occupations. Both males and females will move to the occupations where the original $\alpha$ was low. The reason is that it is now less costly to work in these occupations because

there is less penalty. However, these occupations are relatively more attractive for males. The reason is that males value working time more relative to women (i.e. they have a lower $\nu$) and since these occupations have now less penalty it is more profitable for them to work there. This change in sorting raises the gender gap.

### 6.3.2 A Change in Female Household Care Hours

In this exercise we make male and female preferences for household care more equal. We reduce the gap in the $\nu$'s by 50%; $\nu_m$ drops to 0.507 and $\nu_f$ rises to 0.424. The overall gender gap drops to 5.6% as shown in Table 13. The within component falls from 6.4% to 3.2%. As female preferences become more similar to those of males, females supply more market work. As a result, the penalty is smaller and so is the difference in earnings per hour across genders.

An alternative way of looking at this counterfactual is shown in Figure 6. The horizontal axis measures the distance between $\nu$'s (a value of 0 is equal to the baseline and a value of 0.5 means $\nu_m = \nu_f$). On the vertical axis we measure the within component of the gender gap. As the distance between the $\nu$'s drops, the within component goes to zero. The rate at which it drops to zero depends on the occupation. As occupations are defined by their $\alpha$, we plot the within component against the within component for occupations with a small value of $\alpha$, 0.6; a middle value, 1.5; and a high value, 12. When $\alpha$ is large i.e. coordination costs are low, the within component is virtually zero even when women supply substantially more home care than males. When males and females are in an occupation such as "Managers" with ($\alpha \approx 0.6$), then the within gender gap is low only when preferences between males and females are similar.

Interestingly, the between component rises. When the $\nu$'s are closer, it is better for women to move to low $\alpha$ occupations and for men to move to high $\alpha$ occupations. Since there is a negative correlation between $\alpha$ and earnings, in partial equilibrium (when wages are fixed) the between component falls. However, in general equilib-

rium, wages adjust and the between component actually rises. When $\nu$ goes up, the effective labor supply of women goes up (i.e. they do not care as much about household care as before). Women's labor supply goes up in all the occupations but particularly in occupations that are relatively more populated by women. As a result, wages in female-intensive occupations fall leading to an increase in the between component.

# 7 Final Remarks

Although women have made remarkable gains in the labor market over the past five decades, there is still a substantial gap in their earnings relative to men. Most of the unexplained gap is associated with earnings gaps that arises within occupations. In this paper we explore a mechanism which can explain why the gender gap differs across occupations.

Central to our analysis is the joint decision of workers to allocate time to market work and to household care. Using time-diary data we document that married women with children who report to be full-time workers work less on the job and do more household care than their male counterparts. We also document that occupations vary in the degree to which total hours worked in the occupation are concentrated during peak hours of the day– a measure which we interpret as the level of coordinated schedules in the occupation. Our measure of an (in)flexible work schedule is therefore distinct from other papers in the literature which focus on the quantity of hours worked. We find that while men and single women receive a wage premium in occupations with concentrated schedules, married women with children less so. Conditional on being in an occupation, less working time (more household care time) at peak hours of the day entails a productivity loss and thus earnings are lowered for women relative to men. We calibrate our model to US data and show that the greater demand for household care time by women together with the coordination

of work time required in different occupations generate a gender wage gap of 6.1 percent which approximately corresponds to 27% of the observed gender earnings gap among married men and women with children. If occupation-level coordination was set equal to the level of "Health Care Support"– an occupation with relatively low coordination, the gender gap due to women's higher demand for household time falls to 2.3%.

# References


Altonji, J. G., and C. H. Paxson (1988): "Labor Supply Preferences, Hours Constraints, and Hours-Wage Trade-Offs," *Journal of Labor Economics*, 6(2), 254–276.

Altonji, J. G., and C. H. Paxson (1992): "Labor Supply, Hours Constraints, and Job Mobility," *Journal of Human Resources*, 27(2), 256–278.

Blundell, R., M. Brewer, and M. Francesconi (2008): "Job Changes and Hours Changes: Understanding the Path of Labor Supply Adjustment," *Journal of Labor Economics*, 26(3), 421–453.

Cardoso, A. R., D. S. Hamermesh, and J. Varejao (2012): "The Timing of Labor Demand," *Annals of Economics and Statistics*, (105-106), 15–34.

Cha, Y., and K. A. Weeden (2014): "Overwork and the Slow Convergence in the Gender Gap in Wages," *American Sociological Review*, 79(3), 457–484.

Chetty, R., J. N. Friedman, T. Olsen, and L. Pistaferri (2011): "Adjustment Costs, Firm Responses, and Micro vs. Macro Labor Supply Elasticities: Evidence from Danish Tax Records," *The Quarterly Journal of Economics*, 126(2), 749–804.

Cortes, P., and J. Pan (2016a): "Prevalence of Long Hours and Skilled WomenâĂŹs Occupational Choices," Discussion paper, Boston University, Questrom School of Business.

——— (2016b): "When Time Binds: Returns to Working Long Hours and the Gender Wage gap among the Highly Skilled," Discussion paper, Boston University, Questrom School of Business.

Eden, M. (2017): "The Week," Discussion paper, Brandeis University.

Erosa, A., L. Fuster, G. Kambourov, and R. Rogerson (2017): "Hours, Occupations, and Gender Differences in Labor Market Outcomes," NBER Working Papers 23636, National Bureau of Economic Research, Inc.

Gicheva, D. (2013): "Working Long Hours and Early Career Outcomes in the High-End Labor Market," *Journal of Labor Economics*, 31(4), 785 – 824.

Goldin, C. (2014): "A Grand Gender Convergence: Its Last Chapter," *American Economic Review*, 104(4), 1091–1119.

Labanca, C., and D. Pozzoli (2018): "Coordination of Hours within the Firm," Working Papers 7-2018, Copenhagen Business School, Department of Economics.

Prescott, E. C., R. Rogerson, and J. Wallenius (2009): "Lifetime Aggregate Labor Supply with Endogenous Workweek Length," *Review of Economic Dynamics*, 12(1), 23–36.

Rogerson, R. (2011): "Individual and Aggregate Labor Supply with Coordinated Working Times," *Journal of Money, Credit and Banking*, 43, 7–37.

Rogerson, R., and J. Wallenius (2009): "Micro and macro elasticities in a life cycle model with taxes," *Journal of Economic Theory*, 144(6), 2277–2292.

Rosen, H. S. (1976): "Taxes in a Labor Supply Model with Joint Wage-Hours Determination," *Econometrica*, 44(3), 485–507.

Stewart, J. (2010): "The Timing of Maternal Work and Time with Children," *Industrial and Labor Relations Review*, 64(1), 181–200.

# Figures

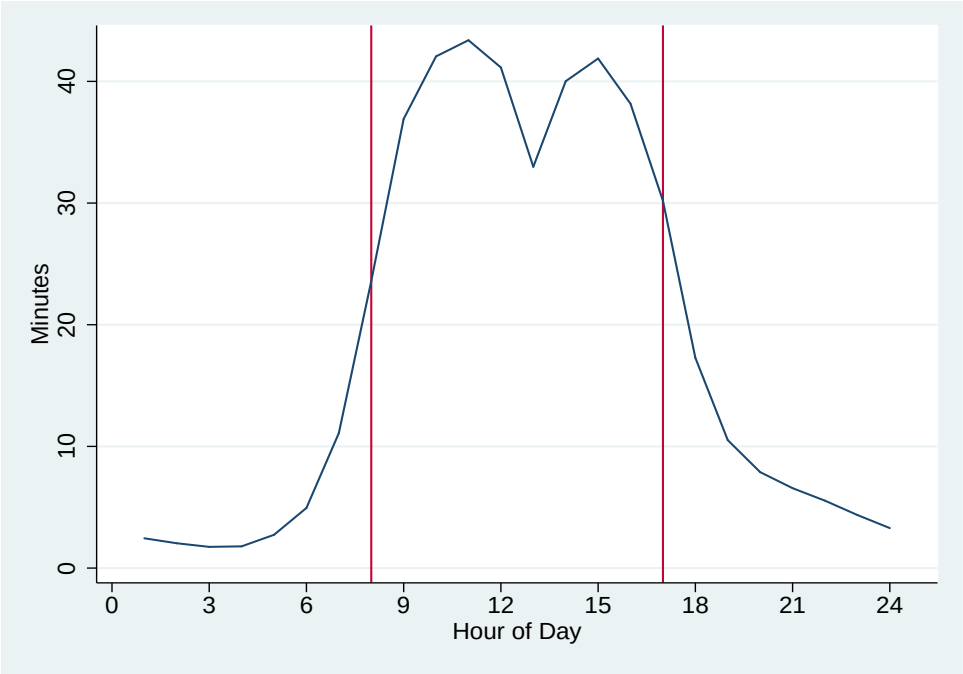


Figure 1: Work among Fulltime Workers

Notes: Data are from 2003-2014 American Time Use Surveys (ATUS). The figure is based on 18-65 year old workers who reported to be working fulltime in the activity summary file. "Work" corresponds to minutes spent on "work and work-related activities" at each hour based on starting and ending times in the time diary data. The figure includes both weekdays and weekends.

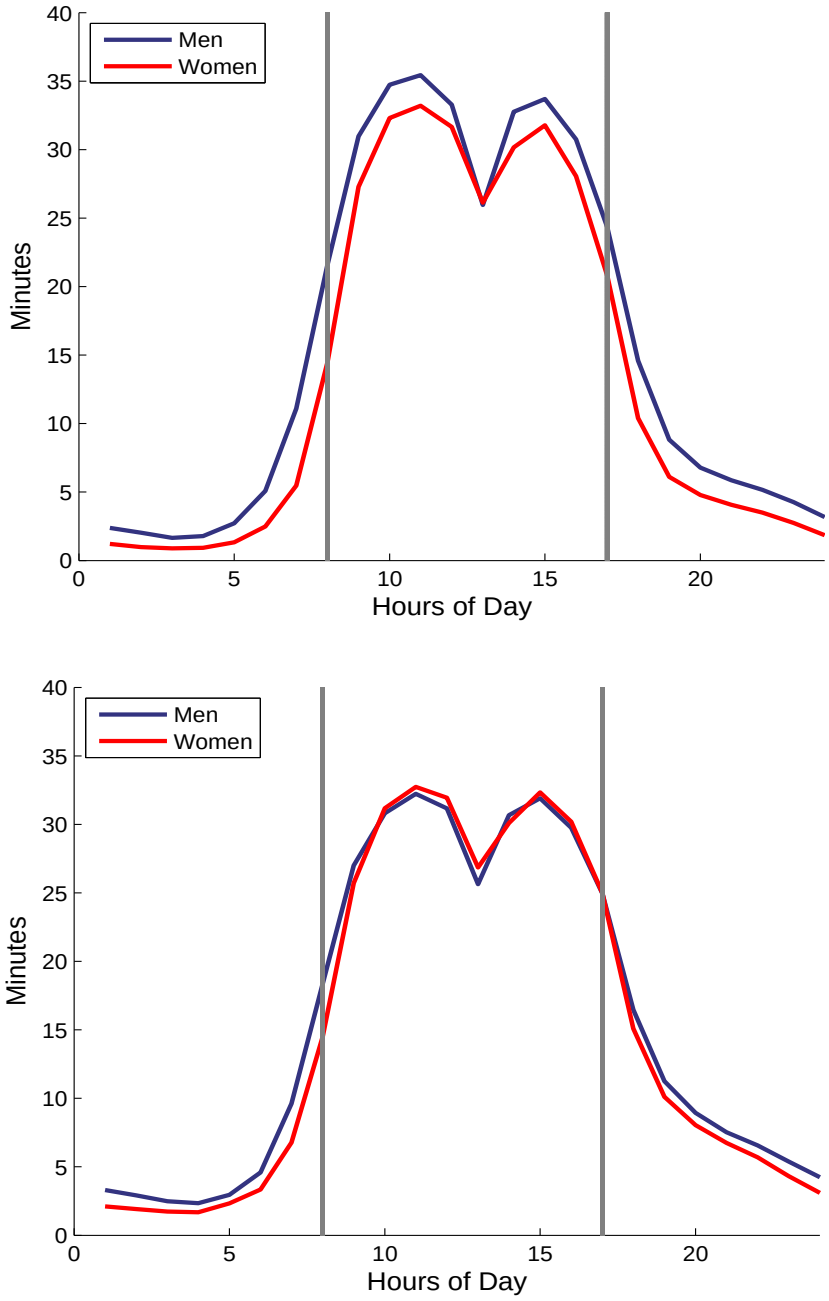


Figure 2: Work among Fulltime Workers

Notes: Data are from 2003-2014 American Time Use Surveys (ATUS). The figure is based on 18-65 year old workers who reported to be working fulltime in the activity summary file. The top panel includes workers who are married with at least one own child in the household. The bottom panel includes workers who are single and without children. "Work" corresponds to minutes spent on "work and work-related activities" at each hour based on starting and ending times in the time diary data. The figure includes both weekdays and weekends.

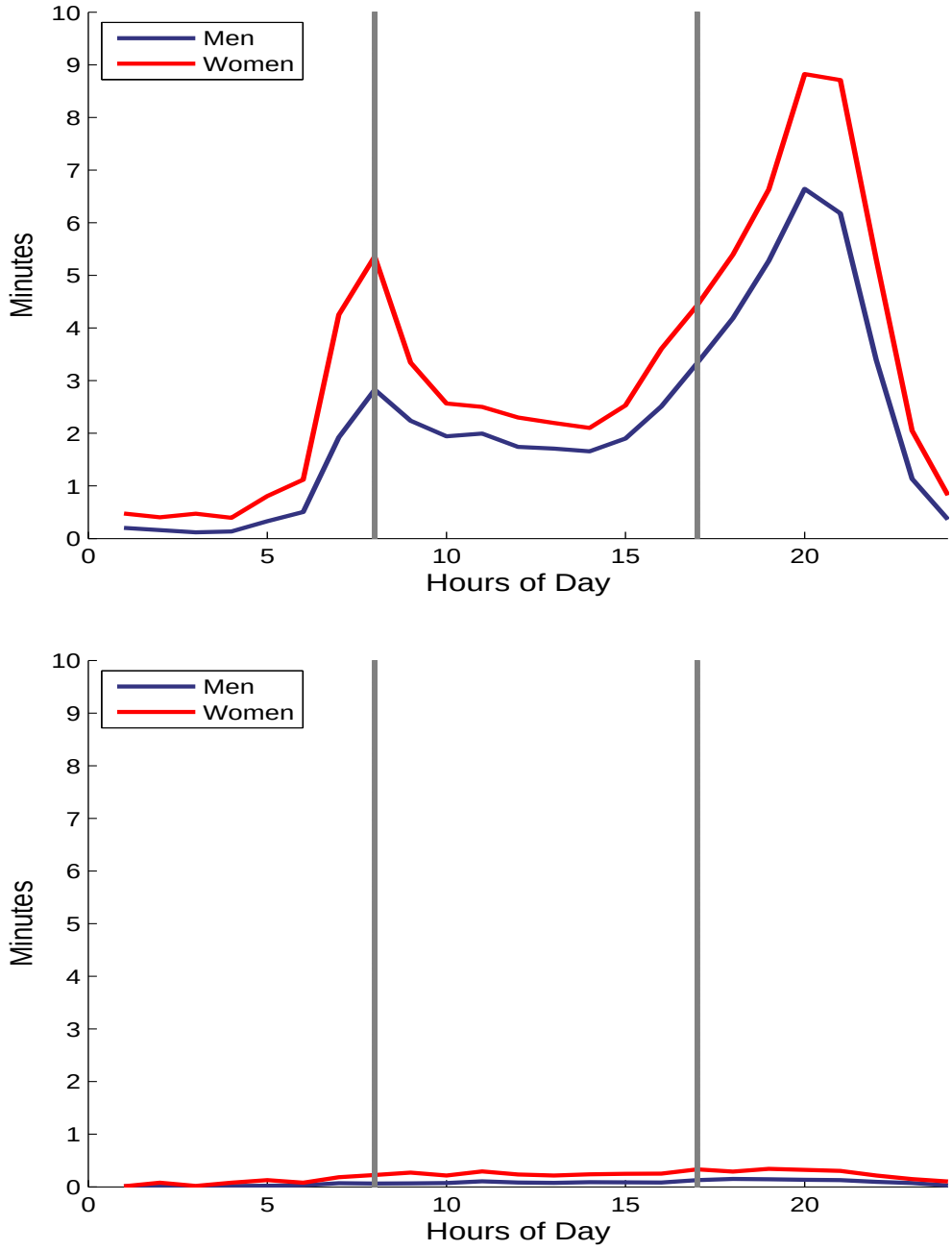


Figure 3: Household Care among Fulltime Workers

Notes: Data are from 2003-2014 American Time Use Surveys (ATUS). The figure is based on 18-65 year old workers who reported to be working fulltime in the activity summary file. The top panel includes workers who are married with at least one own child in the household. The bottom panel includes workers who are single and without children. "Household Care" corresponds to minutes spent on "caring for and helping household members" at each hour based on starting and ending times in the time diary data. The figure includes both weekdays and weekends.

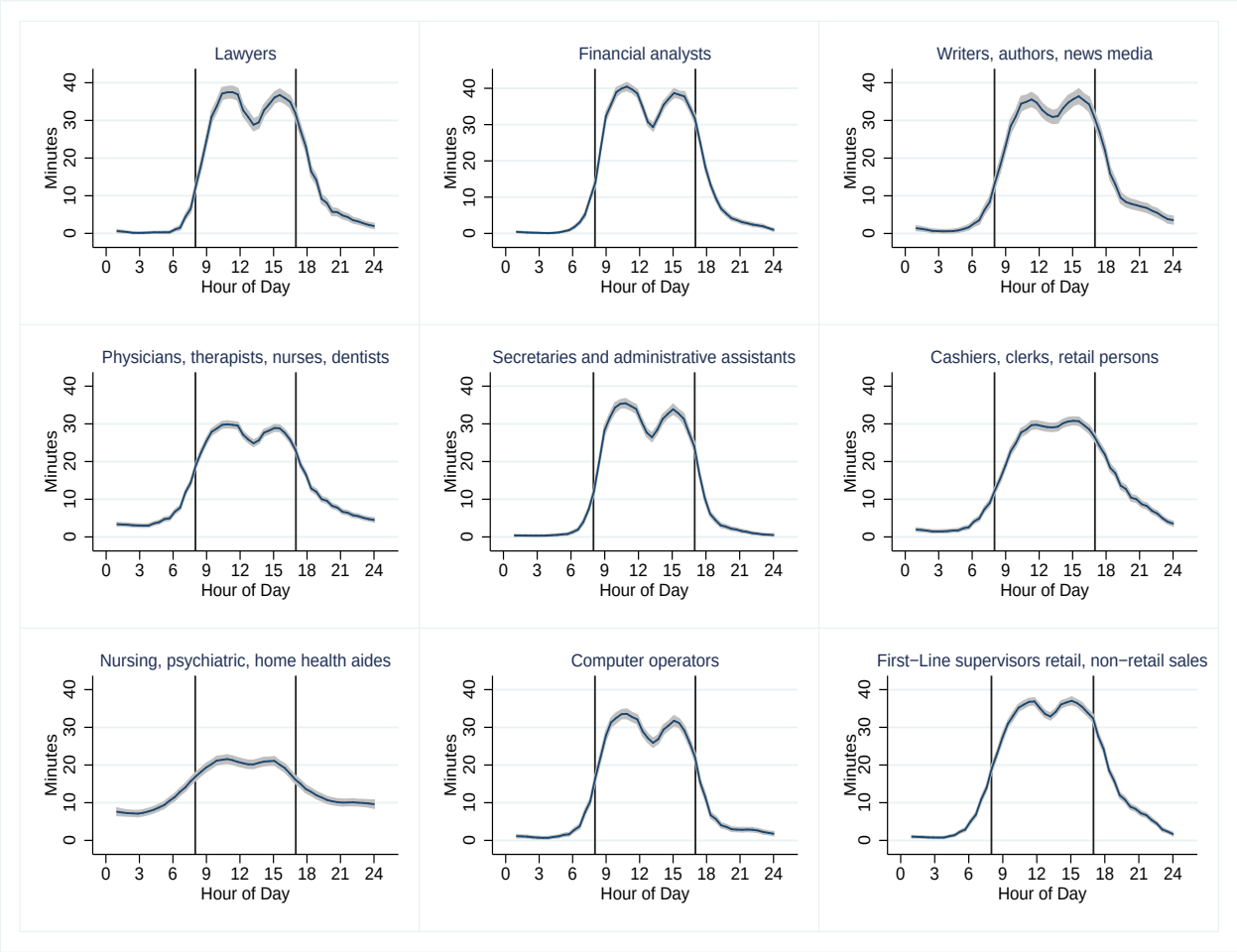


Figure 4: Timing of Work in Selected Occupations

Notes: Data are from 2003-2014 American Time Use Surveys (ATUS). The figure is based on 18-65 year old workers who reported to be working fulltime in the activity summary file. "Work" corresponds to minutes spent on "work and work-related activities" at each hour based on starting and ending times in the time diary data. The figure includes both weekdays and weekends. The figures display smoothed values from local polynomial regressions. We mapped detailed 2002 Census occupation codes to detailed Standard Occupation Classification (SOC) codes and aggregated to 94 SOC categories.

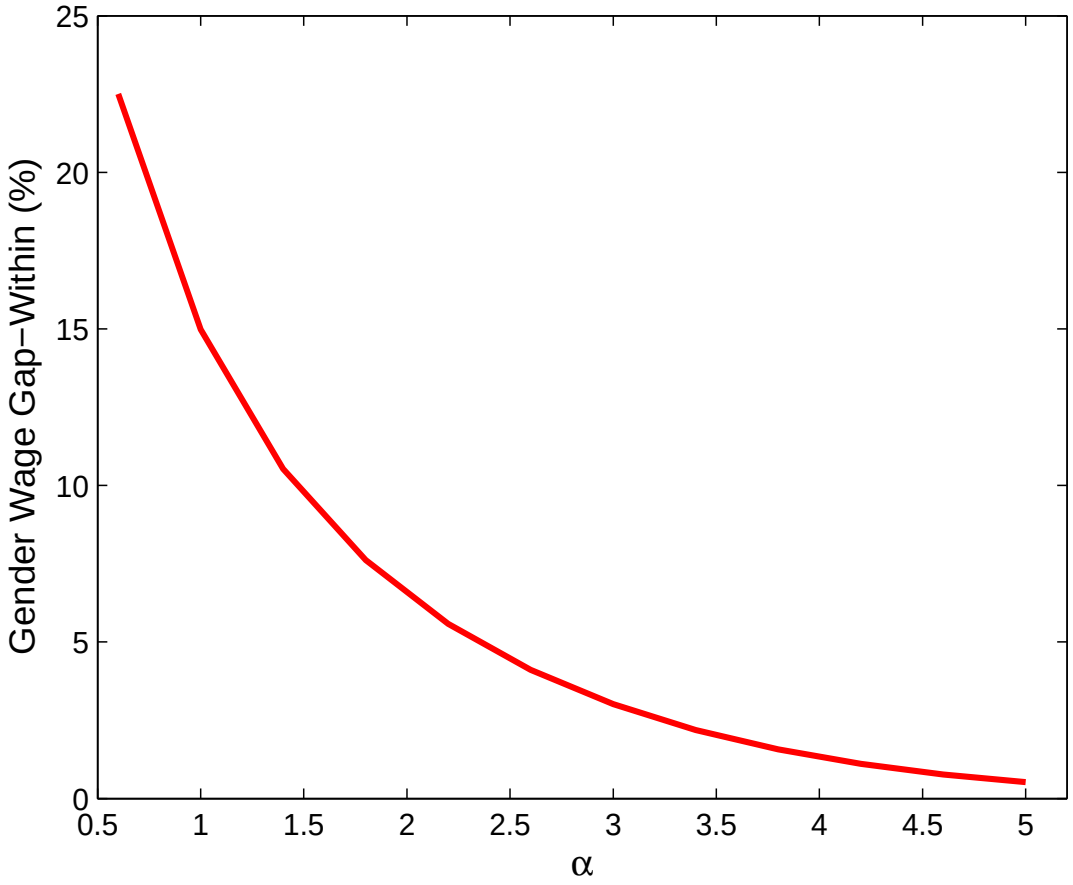


Figure 5: Gender Earnings Gap Within Occupations: The Effect of $\alpha$

Notes: The figure shows the value of the within component of the gender wage gap (y-axis), as defined in Section 6, for the whole economy when the parameter $\alpha$ (x-axis) is equal for every occupation and takes values from 0.6 (the minimum estimated value for our baseline economy) to 5.

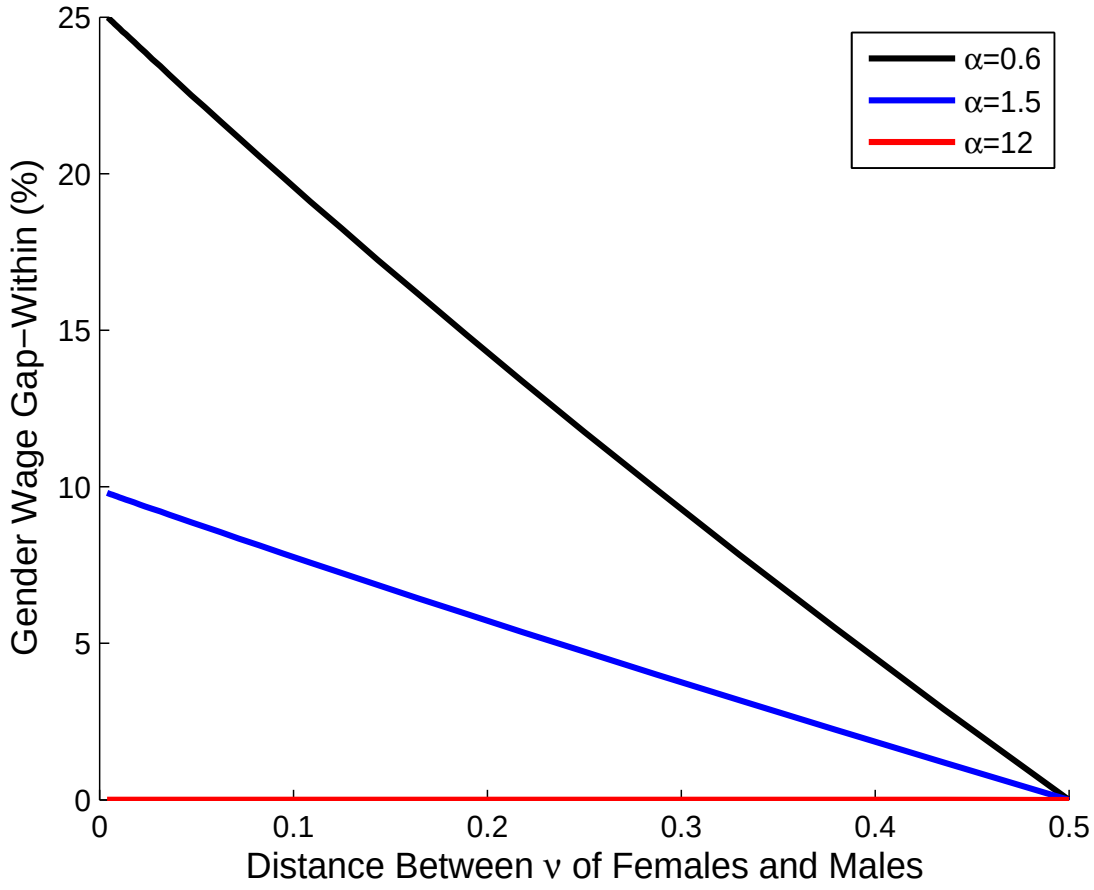


Figure 6: Gender Earnings Gap Within Occupations: The Effect of $\nu$

Notes: The figure shows the value of the within component of the gender wage gap (y-axis), as defined in Section 6, for the whole economy when we change the difference between females and males in the value of parameter $\nu$ (x-axis). A value of 0 in the x-axis indicates that the value of the parameter $\nu$ for females and males are equal to the ones obtained in the calibration of the baseline economy, that is $\nu_f = 0.38$ and $\nu_m = 0.55$. A value of 0.5 indicates that $\nu_m = \nu_f$.

# Tables

Table 1: Work among Fulltime Workers, Married with Children

| | Weekday | Weekend | Weekday | | | |
|---|---|---|---|---|---|---|
| Female Gap in Work Hours | -0.898*** | -0.749*** | -0.901*** | -0.911*** | -0.703*** | -0.490*** |
| | (0.0694) | (0.0674) | (0.0692) | (0.0702) | (0.0698) | (0.0768) |
| Observations | 12113 | 12344 | 12113 | 12113 | 12113 | 8393 |
| Day of Week and Year | | | x | x | x | x |
| Education ,Age and Race | | | | x | x | x |
| Usual Weekly Hours | | | | | x | x |
| Usual Weekly Hours less than 50 | | | | | | x |
| Average Hours, Men | 7.904 | 2.163 | | | | |
| Average Hours, Women | 7.006 | 1.414 | | | | |
| Average Hours, Total | 7.611 | 1.906 | | | | |

Notes: Data are from 2003-2014 American Time Use Surveys (ATUS). The table is based on 18-65 year old workers who reported to be working fulltime in the activity summary file who are married with at least one own child in the household. "Work" corresponds to minutes spent on "work and work-related activities" at each hour based on starting and ending times in the time diary data. Each column reports the coefficient on "female" dummy with various additional controls. Column (5) controls for usual weekly hours worked reported on the activity summary file. Column (6) only includes workers who reported usual weekly hours less than 50.

Table 2: Household Care among Fulltime Workers, Married with Children

| | Weekday | Weekend | Weekday | | | |
|---|---|---|---|---|---|---|
| Female Gap in Household Hours | 0.436*** | 0.264*** | 0.436*** | 0.349*** | 0.319*** | 0.266*** |
| | (0.0276) | (0.0332) | (0.0276) | (0.0270) | (0.0272) | (0.0327) |
| Observations | 12113 | 12344 | 12113 | 12113 | 12113 | 8393 |
| Day of Week and Year | | | x | x | x | x |
| Education ,Age and Race | | | | x | x | x |
| Usual Weekly Hours | | | | | x | x |
| Usual Weekly Hours less than 50 | | | | | | x |
| Average Hours, Men | 0.821 | 1.002 | | | | |
| Average Hours, Women | 1.257 | 1.267 | | | | |
| Average Hours, Total | 0.963 | 1.093 | | | | |

Notes: Data are from 2003-2014 American Time Use Surveys (ATUS). The table is based on 18-65 year old workers who reported to be working fulltime in the activity summary file who are married with at least one own child in the household. "Household Care" corresponds to minutes spent on " caring for and helping household members" at each hour based on starting and ending times in the time diary data. Each column reports the coefficient on "female" dummy with various additional controls. Column (5) controls for usual weekly hours worked reported on the activity summary file. Column (6) only includes workers who reported usual weekly hours less than 50.

## Table 3: Ratio8to5 For Occupations With Fraction Of College $\leq .4$

| | Occupations | # Workers | # Full Time Workers | Work | Work_Standardized |
|---|---|---|---|---|---|
| 1 | Fishers and Related Fishing Workers | 16 | 6 | .304 | -3.799 |
| 2 | Firefighters | 178 | 168 | .504 | -2.018 |
| 3 | Forest and Conservation Workers,logging | 43 | 27 | .533 | -1.765 |
| 4 | Nursing, Psychiatric, and Home Health Aides | 1252 | 769 | .547 | -1.638 |
| 5 | Ushers, Lobby Attendants, and Ticket Takers | 192 | 71 | .55 | -1.613 |
| 6 | Combined Food Preparation and Serving Workers, Including Fast Food | 1307 | 448 | .553 | -1.581 |
| 7 | Wardens,jailors,correctional officers | 761 | 720 | .557 | -1.551 |
| 8 | Dishwashers,hosts,hostesses | 452 | 124 | .565 | -1.48 |
| 9 | Police and Detectives,protective service | 205 | 190 | .577 | -1.367 |
| 10 | extraction,mining related | 91 | 78 | .579 | -1.354 |
| 11 | Railroad Brake, Signal, and Switch Operators | 73 | 70 | .581 | -1.338 |
| 12 | Crossing Guards,animal control, lifeguards etc | 671 | 463 | .597 | -1.189 |
| 13 | Transportation Attendants, except Flight Attendants | 110 | 75 | .598 | -1.187 |
| 14 | Helpers, Construction Trades | 43 | 30 | .619 | -.994 |
| 15 | Chefs Head Cooks | 452 | 349 | .624 | -.954 |
| 16 | Molders and Molding Machine Setters, Operators, and Tenders, Metal and Plastic | 1038 | 976 | .633 | -.872 |
| 17 | Laborers and Freight, Stock, and Material Movers | 1813 | 1358 | .633 | -.876 |
| 18 | Miscellaneous Assemblers and Fabricators | 648 | 579 | .633 | -.868 |
| 19 | Cooks,Food Preparation Workers | 1296 | 653 | .637 | -.834 |
| 20 | Baggage Porters, trans.attendants,tour and travel | 101 | 52 | .642 | -.791 |
| 21 | Inspectors, Testers, Sorters, Samplers, and Weighers | 1614 | 1391 | .643 | -.784 |
| 22 | Miscellaneous Plant and System Operators | 166 | 154 | .645 | -.764 |
| 23 | First-Line Supervisors of Production and Operating Workers | 515 | 489 | .65 | -.725 |
| 24 | Telephone and related Operators | 58 | 45 | .658 | -.653 |
| 25 | Bookbinders and Bindery Workers, printing press operators | 165 | 142 | .658 | -.65 |
| 26 | Food Processing Workers, All Other | 345 | 256 | .658 | -.649 |
| 27 | Ship and Boat Captains and Operators | 20 | 17 | .663 | -.606 |
| 28 | Motor Vehicle Operators, All Other | 2225 | 1636 | .664 | -.6 |
| 29 | Maids and housekeeping cleaners | 2195 | 1272 | .668 | -.562 |
| 30 | Dispatchers,office clerks , cargo agents | 1969 | 1548 | .673 | -.514 |
| 31 | Agricultural Inspectors, animal breeders etc | 552 | 395 | .674 | -.511 |
| 32 | Supervisors of Transportation and Material Moving Workers | 130 | 117 | .694 | -.328 |
| 33 | Child care,Personal Care and Service Workers, All Other | 1834 | 834 | .705 | -.231 |
| 34 | Medical Records and Health Information Technicians | 1373 | 991 | .709 | -.195 |
| 35 | Cashiers,clers,retail persons | 3173 | 1431 | .716 | -.133 |
| 36 | First-Line Supervisors of Gaming Workers,personal service | 181 | 134 | .72 | -.1 |
| 37 | Tailors, Dressmakers, and Sewers etc | 393 | 291 | .736 | .039 |
| 38 | First-Line Supervisors of Landscaping, Lawn Service, and Groundskeeping Workers | 308 | 234 | .741 | .088 |
| 39 | First-Line Supervisors/Managers of Farming, Fishing, and Forestry Workers | 39 | 35 | .741 | .089 |
| 40 | First-Line Supervisors of Retail , non retail Sales Workers | 2583 | 2212 | .755 | .213 |
| 41 | installation, maintenance workers | 1234 | 1106 | .757 | .233 |
| 42 | Carpenters,woodworkers | 116 | 98 | .777 | .406 |
| 43 | First-Line Supervisors of Construction Trades and Extraction Workers | 453 | 407 | .777 | .409 |
| 44 | Automotive Mechanics | 950 | 836 | .78 | .436 |
| 45 | Animal Trainers,Nonfarm Animal Caretakers | 126 | 76 | .78 | .433 |
| 46 | First-Line Supervisors of Mechanics, Installers, and Repairers | 215 | 211 | .782 | .451 |
| 47 | Door-to-Door Sales Workers, News and Street Vendors, and Related Workers | 976 | 536 | .789 | .517 |
| 48 | First-Line Supervisors of Office and Administrative Support Workers | 1013 | 891 | .791 | .534 |
| 49 | Plasterers and Stucco Masons, repair works | 3188 | 2586 | .802 | .628 |
| 50 | Engineering,drafters and related Technicians | 423 | 379 | .804 | .644 |
| 51 | Electronic Equipment Installers and Repairers, Motor Vehicles | 413 | 368 | .806 | .663 |
| 52 | other Construction and Related Workers | 204 | 185 | .807 | .672 |
| 53 | Grounds Maintenance Workers | 701 | 392 | .809 | .695 |
| 54 | personal appearance workers | 544 | 267 | .816 | .754 |
| 55 | Eligibility Interviewers, Government Programs, other clerks | 2810 | 2013 | .824 | .824 |
| 56 | Medical Assistants | 694 | 400 | .833 | .904 |
| 57 | Computer Operators | 1726 | 1293 | .84 | .964 |
| 58 | teacher assist,other teaching support | 702 | 371 | .86 | 1.144 |
| 59 | Clerks | 1694 | 1215 | .863 | 1.17 |
| 60 | Secretaries and Administrative Assistants | 2088 | 1568 | .893 | 1.434 |
| 61 | Occupational Therapy Assistants and Aides | 50 | 37 | .923 | 1.706 |
| 62 | Morticians, Undertakers, and Funeral Directors | 16 | 6 | .925 | 1.719 |

Notes: Data are from 2003-2014 American Time Use Surveys (ATUS). The figure is based on 18-65 year old workers. We mapped detailed 2002 Census occupation codes to detailed Standard Occupation Classification (SOC) codes and aggregated to 94 SOC categories. "Ratio8to5" is the ratio of total hours worked by all fulltime workers during the hours 8 a.m. to 5 p.m. relative to total minutes worked in each occupation category. "Ratio8to5std" reports standardized values with mean zero and standard deviation equal to 1. The table keeps those occupations where the fraction of college workers in the occupation is less than 0.4.

Table 4: Ratio8to5 for Occupations With Fraction Of College $\geq$.4

| | Occupations | # Workers | # Full Time Workers | Work | Work_Standardized |
|---|---|---|---|---|---|
| 1 | Geological, chemical, natural science Technicians | 175 | 140 | .62 | -.984 |
| 2 | Air Traffic Controllers and Airfield Operations Specialists | 96 | 71 | .657 | -.658 |
| 3 | Photographers, sound and light technicians,other media support | 169 | 101 | .689 | -.371 |
| 4 | Directors,clergy, Religious Activities and Education | 403 | 280 | .7 | -.28 |
| 5 | Podiatrists, therapists,nurses, dentists | 3449 | 2471 | .7 | -.274 |
| 6 | sports ,entertainment | 440 | 197 | .702 | -.255 |
| 7 | other teachers | 508 | 215 | .762 | .271 |
| 8 | Post secondary teachers | 997 | 640 | .765 | .301 |
| 9 | other miscellaneous managers | 5966 | 4836 | .767 | .316 |
| 10 | Writers and Authors,news media | 546 | 397 | .786 | .485 |
| 11 | Chief Executives, general managers | 1673 | 1499 | .788 | .501 |
| 12 | Designers, artists | 606 | 416 | .809 | .696 |
| 13 | pre school, middle School Teachers | 3541 | 2912 | .817 | .761 |
| 14 | computer/software related | 2306 | 2131 | .817 | .759 |
| 15 | Sales Representatives, Wholesale and Manufacturing | 815 | 713 | .819 | .78 |
| 16 | Surveyors, Cartographers,architects, and Photogrammetrists | 168 | 138 | .82 | .786 |
| 17 | Engineers | 1290 | 1215 | .822 | .81 |
| 18 | Lawyers | 759 | 655 | .824 | .824 |
| 19 | Transportation, industrial,HR, admin managers | 1916 | 1805 | .828 | .858 |
| 20 | Miscellaneous Community and Social Service Specialists | 1253 | 1047 | .829 | .871 |
| 21 | Public Relations, Fundraising, advert, marketing | 719 | 653 | .831 | .885 |
| 22 | astronomers, ennv., physical science | 275 | 254 | .835 | .92 |
| 23 | Other Healthcare Practitioners and health care support | 50 | 43 | .838 | .954 |
| 24 | Training and development specialists,business operations | 2123 | 1816 | .838 | .953 |
| 25 | Travel,sales Agents | 1038 | 884 | .839 | .962 |
| 26 | Financial Analysts,Accountant,Auditors | 2110 | 1822 | .847 | 1.033 |
| 27 | Social sciences | 291 | 232 | .85 | 1.053 |
| 28 | natural science, biology scientists | 214 | 197 | .856 | 1.107 |
| 29 | Math,stats, operations research, actuaries | 120 | 108 | .872 | 1.252 |
| 30 | curators,librarians,lib technicians | 203 | 148 | .898 | 1.486 |
| 31 | Paralegals,legal support | 366 | 302 | .901 | 1.508 |

Notes: Data are from 2003-2014 American Time Use Surveys (ATUS). The figure is based on 18-65 year old workers. We mapped detailed 2002 Census occupation codes to detailed Standard Occupation Classification (SOC) codes and aggregated to 94 SOC categories. "Ratio8to5" is the ratio of total hours worked by all fulltime workers during the hours 8 a.m. to 5 p.m. relative to total hours worked in each occupation category. "Ratio8to5std" reports standardized values with mean zero and standard deviation equal to 1. The table keeps those occupations where the fraction of college workers in the occupation is greater or equal to 0.4.

Table 5: Rank Correlations between Importance of Occupational Characteristics and Ratio8to5

| #Cat. | Name | Corr. Coeff. |
|---|---|---|
| 1 | Assisting and caring for others | -0.1828 |
| 2 | Coaching and developing others | 0.1283 |
| 3 | Developing_and_Building_Teams | 0.1380 |
| 4 | Establishing_and_Maintaining_Interpersonal_Relationships | 0.3777 |
| 5 | Face-to-Face_Discussions | 0.2964 |
| 7 | Social orientation | 0.1528 |
| 8 | Training_and_Teaching_Others | -0.0379 |
| 10 | Guiding_Directing_and_Motivating_Subordinates | 0.1204 |

Notes: The table shows rank correlations between importance of O*NET occupational characteristics and our standardized *Ratio8to5* for 94 SOC occupations. *Ratio8to5* is the ratio of total hours worked by all fulltime workers during the hours 8 a.m. to 5 p.m. relative to total hours worked in each occupation category in the ATUS time diary data. O*NET defines the importance of occupational characteristics for detailed SOC occupations. We aggregate the indexes to our 94 occupations by taking a weighted average where the weights are the total number of workers in each detailed SOC occupation.

Table 6: Gender Gap in Log Weekly Earnings by Coordination Measure Ratio8to5

| | (1) baseline | (2) baseline+agg educ | (3) baseline+agg educ+ overwrk |
|---|---|---|---|
| Panel A: All | | | |
| female | -0.218*** | -0.253*** | -0.246*** |
| | (0.0222) | (0.0161) | (0.0173) |
| ratio8to5 | 0.118*** | 0.0673** | 0.0707** |
| | (0.0248) | (0.0258) | (0.0261) |
| femaleXratio8to5 | -0.0468* | -0.0407* | -0.0342 |
| | (0.0251) | (0.0209) | (0.0209) |
| Observations | 259527 | 259527 | 259527 |
| Panel B: Single Without Children | | | |
| female | -0.136*** | -0.169*** | -0.166*** |
| | (0.0182) | (0.0155) | (0.0164) |
| ratio8to5 | 0.106*** | 0.0620** | 0.0629** |
| | (0.0211) | (0.0280) | (0.0277) |
| femaleXratio8to5 | -0.0150 | -0.0144 | -0.0117 |
| | (0.0204) | (0.0213) | (0.0214) |
| Observations | 72299 | 72299 | 72299 |
| Panel C: Married With Children | | | |
| female | -0.261*** | -0.296*** | -0.288*** |
| | (0.0262) | (0.0185) | (0.0196) |
| ratio8to5 | 0.114*** | 0.0685** | 0.0726** |
| | (0.0280) | (0.0262) | (0.0283) |
| femaleXratio8to5 | -0.0606* | -0.0555** | -0.0470* |
| | (0.0313) | (0.0238) | (0.0236) |
| Observations | 108810 | 108810 | 108810 |

Notes: Standard errors in parentheses. * $p < .10$, ** $p < .05$, *** $p < .001$. Data are from 2003-2014 ATUS-CPS files. CPS data includes all individuals in the final interview month selected to participate in the ATUS and members of their households. The sample includes 18-65 year old workers who reported usual weekly hours $\geq$35 and had positive weekly earnings. The tables report coefficients from regression of log weekly earnings on female dummy, Ratio8to5 (measured for 94 occupations) and the interaction term. Additional controls include a quartic in age, log weekly hours on the main job, education dummies, race dummies, and year dummies. Column (2) includes the average education level in the occupation as additional control. Column (3) also includes the share of workers in the occupation who work more than 50 hours per week. Standard errors are clustered at the occupation level. Occupations where less than 100 ATUS respondents are used as well as those with Ratio8to5 beyond 2 standard deviations from the mean have been dropped.

Table 7: Log Weekly Earnings by Primary Earner Status and Coordination Measure Ratio8to5 – Men with Working Spouses Only

| | (1) baseline | (2) baseline+agg educ | (3) baseline+agg educ+ overwrk |
|---|---|---|---|
| Panel A: All Men With Working Spouses | | | |
| wifemore | -0.416*** | -0.411*** | -0.410*** |
| | (0.0143) | (0.0130) | (0.0127) |
| ratio8to5 | 0.123*** | 0.0802*** | 0.0813*** |
| | (0.0272) | (0.0223) | (0.0236) |
| wifemore X ratio8to5 | -0.0442** | -0.0422** | -0.0424** |
| | (0.0149) | (0.0139) | (0.0136) |
| Observations | 59024 | 59024 | 59024 |
| Panel B: Men With Working Spouses and Children | | | |
| wifemore | -0.405*** | -0.402*** | -0.401*** |
| | (0.0145) | (0.0133) | (0.0131) |
| ratio8to5 | 0.114*** | 0.0769** | 0.0776** |
| | (0.0296) | (0.0253) | (0.0265) |
| wifemore X ratio8to5 | -0.0404** | -0.0394** | -0.0396** |
| | (0.0170) | (0.0161) | (0.0161) |
| Observations | 40994 | 40994 | 40994 |

Standard errors in parentheses. * $p < .10$, ** $p < .05$, *** $p < .001$. Data are from 2003-2014 ATUS-CPS files. CPS data include individuals in the final interview month selected to participate in the ATUS and members of their households. The sample includes 18-65 year old men who reported usual weekly hours $\geq 35$, had positive weekly earnings, and also have working spouses. "Wifemore" is an indicator if the wife reports higher weekly earnings than the husband. The tables report coefficients from regression of log weekly earnings on "Wifemore" dummy, Ratio8to5 (measured for 94 occupations) and the interaction term. Additional controls include a quartic in age, log weekly hours on the main job, education dummies, race dummies, and year dummies. Column (2) includes the average education level in the occupation as additional control. Column (3) also includes the share of workers in the occupation who work more than 50 hours per week. Standard errors are clustered at the occupation level. Occupations where less than 100 ATUS respondents are used as well as those with Ratio8to5 beyond 2 standard deviations from the mean have been dropped.

Table 8: A Simple Case with Gender Differences

| Occupation | % Workers | Bunching Ratio | Earnings | $l_1 + l_2$ | $l$ | % Females | E. Gap |
|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Panel A: No Gender Differences | | | | | | | |
| 1 | 0.49 | 0.58 | 0.41 | 0.83 | 0.80 | | |
| 2 | 0.51 | 0.53 | 0.39 | 0.81 | 0.80 | | |
| Panel B: Gender-Specific $\nu$ | | | | | | | |
| 1 | 0.44 | 0.55 | 0.46 | 0.91 | 0.90 | 0 | |
| 2 | 0.56 | 0.52 | 0.35 | 0.73 | 0.73 | 89 | |
| Gender Earnings Gap | 1.031 | | | | | | |
| Panel C: Gender-Specific $\nu$ and Tastes | | | | | | | |
| 1 | 0.50 | 0.60 | 0.40 | 0.81 | 0.79 | 50 | 1.05 |
| 2 | 0.50 | 0.51 | 0.40 | 0.81 | 0.80 | 50 | 1.00 |
| Gender Earnings Gap | 1.026 | | | | | | |
| Panel D: A reduction in $\rho$ | | | | | | | |
| 1 | 0.43 | 0.52 | 0.46 | 0.93 | 0.89 | 0 | |
| 2 | 0.57 | 0.51 | 0.35 | 0.73 | 0.73 | 88 % | |
| Gender Earnings Gap | 1.026 | | | | | | |

Note: This table shows the results of the numerical exercises described in Section 4. Panel A refers to the case of no gender differences, i.e. homogeneous agents. Panel B is the case of gender differences in the preferences for household care, governed by parameter $\nu$. Panel C describes the same case of Panel B but we add gender specific taste shocks. Panel D describes the case of a reduction in the elasticity of substitution in household care time during the day. Column refers to the different occupations considered, 1 and 2. Column (2) describes the share of total workers in each occupation. Column (3) is the bunching ratio as defined in Section 2. Column (4) contains the earnings in equilibrium in each occupation. Column (5) contains the total number of working hours in each occupation. Column (6) presents the total number of effective hours, Column (7) the share of females in each occupation, and Column (8) the gender gap in earnings per hour in each occupation. Finally, in Panel B, C and D, the table reports the ratio of earnings of males over females for the whole economy, denoted as the gender earnings gap.

Table 9: Targeted Moments

Panel A: Occupational-level Moments

| Occupation no. | Occupation | Earn. Share | 8*to*5*ratio* | Av. Earn. Per Hour | % Fem. |
|---|---|---|---|---|---|
| 1 | Management | 0.185 | 0.807 | 1.00 | 0.31 |
| 2 | Business and financial operations | 0.062 | 0.856 | 0.90 | 0.52 |
| 3 | Computer and mathematical | 0.053 | 0.834 | 1.08 | 0.21 |
| 4 | Architecture and engineering | 0.042 | 0.825 | 1.03 | 0.08 |
| 5 | Life, physical, and social science | 0.014 | 0.83 | 0.96 | 0.34 |
| 6 | Community and social service occupations | 0.016 | 0.778 | 0.67 | 0.54 |
| 7 | Legal | 0.021 | 0.862 | 1.09 | 0.46 |
| 8 | Education, training, and library | 0.069 | 0.834 | 0.72 | 0.73 |
| 9 | Arts, design, entertainment, sports, and media | 0.014 | 0.817 | 0.82 | 0.33 |
| 10 | Healthcare practitioners and technical | 0.068 | 0.723 | 0.88 | 0.70 |
| 11 | Healthcare support | 0.009 | 0.706 | 0.42 | 0.87 |
| 12 | Protective service | 0.030 | 0.592 | 0.73 | 0.12 |
| 13 | Food preparation and serving related | 0.012 | 0.607 | 0.37 | 0.46 |
| 14 | Building and grounds cleaning and maintenance | 0.017 | 0.713 | 0.40 | 0.31 |
| 15 | Personal care and service | 0.008 | 0.667 | 0.42 | 0.73 |
| 16 | Sales and related | 0.091 | 0.788 | 0.72 | 0.34 |
| 17 | Office and administrative support | 0.085 | 0.826 | 0.54 | 0.72 |
| 18 | Farming, fishing, and forestry | 0.004 | 0.627 | 0.33 | 0.24 |
| 19 | Construction and extraction | 0.055 | 0.791 | 0.62 | 0.01 |
| 20 | Installation, maintenance, and repair | 0.042 | 0.762 | 0.65 | 0.03 |
| 21 | Production | 0.057 | 0.646 | 0.52 | 0.23 |
| 22 | Transportation and material moving | 0.045 | 0.659 | 0.51 | 0.11 |

Panel B: Economy-wide Moments

| | |
|---|---|
| Average Hours Worked Males | 0.61 |
| Average Hours Worked Females | 0.48 |
| 8*to*5*ratio* Work/8*to*5*ratio* Household Care | 2.18 |

Note: The table presents the set moments targeted in the calibration. Panel A shows the set of occupation-specific moments: the sahre of earnings of each occupation (Earn. Share), the 8*to*5*ratio* as defined in Section 2, the average earnings per hour in each occupation (Av. Earn. Per Hour) and the percentage of females in the total workers in each occupation (% Fem.). Panel B shows the moments we match for the economy as a whole

Table 10: Model Fit

Panel A: Occupational-level Moments

| Moment | Correlation Coeff. Model-Data |
|---|---|
| Earnings Share | 1.00 |
| $8to5ratio$ | 0.99 |
| Average Earnings Per Hour | 1.00 |
| % Females | 0.96 |
| Employment Shares | 0.79 |

Panel B: Economy-wide Moments

| Moment | Data | Model |
|---|---|---|
| Av. Hours Worked Male | 0.61 | 0.61 |
| Av. Hours Worked Female | 0.51 | 0.48 |
| $8to5ratio$ Work/$8to5ratio$ Household Care | 2.16 | 1.90 |

Note: The table shows the model fit by comparing the value of the targeted moments in the data and in the model. For the economy-wide moments we show their values in the data and in the model (Panel A). For the occupational-level targeted moments we show in Panel B, for each targeted moment, the correlation across occupations between the value of the moments in the data and in the model.

Table 11: Parameter Values

Panel A: Occupational-specific Parameters

| Occupation no. | Occupation | $\kappa$ | $\alpha$ | $A$ | $T_f$ | $T_m$ |
|---|---|---|---|---|---|---|
| 1 | Management | 0.185 | 1.02 | 0.93 | 4.52 | 1.18 |
| 2 | Business and financial operations | 0.062 | 0.86 | 0.41 | 9.22 | 0.56 |
| 3 | Computer and mathematical | 0.053 | 0.60 | 0.44 | 2.65 | 0.92 |
| 4 | Architecture and engineering | 0.042 | 0.60 | 0.63 | 0.82 | 0.87 |
| 5 | Life, physical, and social science | 0.014 | 0.79 | 2.11 | 1.01 | 0.22 |
| 6 | Community and social service occupations | 0.016 | 1.47 | 0.86 | 1.56 | 0.50 |
| 7 | Legal | 0.021 | 0.60 | 1.56 | 1.94 | 0.19 |
| 8 | Education, training, and library | 0.069 | 1.41 | 0.21 | 22.83 | 0.31 |
| 9 | Arts, design, entertainment, sports, and media | 0.014 | 0.91 | 1.70 | 1.13 | 0.29 |
| 10 | Healthcare practitioners and technical | 0.068 | 2.79 | 0.29 | 14.82 | 0.40 |
| 11 | Healthcare support | 0.009 | 3.05 | 1.34 | 4.62 | 0.22 |
| 12 | Protective service | 0.030 | 253.95 | 0.91 | 0.92 | 0.87 |
| 13 | Food preparation and serving related | 0.012 | 52.06 | 1.07 | 4.17 | 0.66 |
| 14 | Building and grounds cleaning and maintenance | 0.017 | 2.41 | 0.75 | 3.88 | 1.01 |
| 15 | Personal care and service | 0.008 | 164.78 | 1.95 | 3.39 | 0.20 |
| 16 | Sales and related | 0.091 | 1.35 | 1.17 | 5.00 | 0.93 |
| 17 | Office and administrative support | 0.085 | 1.47 | 0.09 | 47.35 | 0.79 |
| 18 | Farming, fishing, and forestry | 0.004 | 169.40 | 3.27 | 0.72 | 0.34 |
| 19 | Construction and extraction | 0.055 | 0.86 | 0.67 | 0.17 | 1.77 |
| 20 | Installation, maintenance, and repair | 0.042 | 1.23 | 0.49 | 0.36 | 1.72 |
| 21 | Production | 0.057 | 4.79 | 0.52 | 4.90 | 1.93 |
| 22 | Transportation and material moving | 0.045 | 3.59 | 1.08 | 1.43 | 1.44 |

Panel B: Rest of Parameters

| | |
|---|---|
| $\rho$ | 0.41 |
| $\nu_f$ | 0.41 |
| $\nu_m$ | 0.56 |

Note: Panel A shows the values of the parameters that are specific to the different occupations and Panel B the values obtained for the utility function, $\nu_m$ and $\nu_f$, for males and females, respectively. In addition, Panel B presents the value obtained for the parameter that governs the elasticity of substitution of the technology for household care, $\rho$.

Table 12: Regressions: Model vs. Data

| | Data | Model |
|---|---|---|
| female | -0.26** | -0.07 |
| | (0.026) | (0.17) |
| ratio8to5 | 0.08** | 0.30*** |
| | (0.028) | (*nil*) |
| femaleXratio8to5 | -0.02** | -0.05 |
| | (0.031) | (0.23) |

Standard errors in parentheses. * $p < .10$, ** $p < .05$, *** $p < .01$. Note: This table shows the estimates of the regression using the data for married workers with children (column Data) and the estimates of the same regression using data generated by the model in its baseline calibration (column Model). The dependent variable is earnings per hour.

Table 13: Gender Earnings Gap (%)

| | Overall | Across | Within |
|---|---|---|---|
| Data | 22.9 | $-3.9$ | 26.8 |
| Baseline | 6.1 | $-0.4$ | 6.5 |
| Equal $\alpha$ | 2.3 | 0.3 | 2.0 |
| 50% Drop in $\nu_m - \nu_f$ | 5.6 | 2.4 | 3.2 |

Note: The table shows the overall gender wage gap (Overall) and its decomposition into portion that is explained by the differences in the gender wage gap across occupations (Across) and the portion explained by differences in earnings between males and females within occupations (Within). It shows their values in the Data, in the baseline economy and in two counterfactual economies: (i) the one in which the parameter $\alpha$ is the same across occupations and equal to 3.05 (the one corresponding to Healthcare support) and, (ii) in the case that the difference between the calibrated values for $\nu_m$ and $\nu_f$ decreases by 50%.

# Appendix

Table A.1: Gender Gap in Log Weekly Earnings – Married with Children, by College/Non-College

| | (1) baseline | (2) baseline+agg educ | (3) baseline+agg educ+ overwrk |
|---|---|---|---|
| Panel A: College | | | |
| female | -0.172*** | -0.215*** | -0.219*** |
| | (0.0405) | (0.0262) | (0.0290) |
| ratio8to5 | 0.148*** | 0.0819** | 0.0983** |
| | (0.0422) | (0.0370) | (0.0453) |
| femaleXratio8to5 | -0.155** | -0.113** | -0.0811** |
| | (0.0547) | (0.0408) | (0.0388) |
| Observations | 42928 | 42928 | 42928 |
| Panel B: Non-College | | | |
| female | -0.286*** | -0.327*** | -0.325*** |
| | (0.0205) | (0.0198) | (0.0203) |
| ratio8to5 | 0.110*** | 0.0749** | 0.0751** |
| | (0.0282) | (0.0304) | (0.0306) |
| femaleXratio8to5 | -0.0478* | -0.0590** | -0.0574** |
| | (0.0278) | (0.0264) | (0.0264) |
| Observations | 65882 | 65882 | 65882 |

Notes: Standard errors in parentheses. * $p < .10$, ** $p < .05$, *** $p < .001$. Data are from 2003-2014 ATUS-CPS files. CPS data includes all individuals in the final interview month selected to participate in the ATUS and members of their households. The sample includes 18-65 year old workers who reported usual weekly hours $\geq$35, had positive weekly earnings, and are married with at least one own child in the household. "College" refers to those who hold at least a bachelors degree. The tables report coefficients from regression of log weekly earnings on female dummy, Ratio8to5 (measured for 94 occupations) and the interaction term. Additional controls include a quartic in age, log weekly hours on the main job, education dummies, race dummies, and year dummies. Column (2) includes the average education level in the occupation as additional control. Column (3) also includes the share of workers in the occupation who work more than 50 hours per week. Standard errors are clustered at the occupation level. Occupations where less than 100 ATUS respondents are used as well as those with Ratio8to5 beyond 2 standard deviations from the mean have been dropped.

Table A.2: Gender Gap in Log Weekly Earnings – Married with Children, May 2004 Work Schedule Supplement

| | (1) baseline | (2) baseline+agg educ | (3) baseline+agg educ+ overwrk |
|---|---|---|---|
| Panel A: All Workers | | | |
| female | -0.320*** | -0.353*** | -0.343*** |
| | (0.0279) | (0.0230) | (0.0230) |
| ratio8to5 | 0.107*** | 0.0621** | 0.0674** |
| | (0.0284) | (0.0232) | (0.0223) |
| femaleXratio8to5 | -0.0458 | -0.0517* | -0.0404 |
| | (0.0352) | (0.0291) | (0.0288) |
| Observations | 3255 | 3255 | 3255 |
| Panel B: Excluding Shift Workers | | | |
| female | -0.321*** | -0.356*** | -0.344*** |
| | (0.0286) | (0.0237) | (0.0235) |
| ratio8to5 | 0.114*** | 0.0629** | 0.0716** |
| | (0.0311) | (0.0247) | (0.0244) |
| femaleXratio8to5 | -0.0565 | -0.0553* | -0.0451 |
| | (0.0363) | (0.0291) | (0.0296) |
| Observations | 2881 | 2881 | 2881 |

Notes: Standard errors in parentheses. * $p < .10$, ** $p < .05$, *** $p < .001$. Data are from May 2004 Work Schedule Supplement of the CPS Survey. The sample includes 18-65 year old workers who reported usual weekly hours $\geq$35, had positive weekly earnings, and are married with at least one own child in the household. The tables report coefficients from regression of log weekly earnings on female dummy, Ratio8to5 (measured for 94 occupations) and the interaction term. Additional controls include a quartic in age, log weekly hours on the main job, education dummies, race dummies, and year dummies. Column (2) includes the average education level in the occupation as additional control. Column (3) also includes the share of workers in the occupation who work more than 50 hours per week. Bottom panel excludes workers who report working "evening shift", "night shift", "rotating shift", "split shift", "irregular schedule", or "some other shift". Standard errors are clustered at the occupation level. Occupations where less than 100 ATUS respondents are used as well as those with Ratio8to5 beyond 2 standard deviations from the mean have been dropped.

Table A.3: Gender Gap in Log Weekly Earnings by Concentration Index

| | (1) baseline | (2) baseline+agg educ | (3) baseline+agg educ+ overwrk |
|---|---|---|---|
| Panel A: All | | | |
| female | -0.237*** | -0.271*** | -0.260*** |
| | (0.0194) | (0.0174) | (0.0187) |
| conc index | 0.121*** | 0.0717** | 0.0812** |
| | (0.0228) | (0.0241) | (0.0241) |
| femaleXconc index | -0.0685** | -0.0554** | -0.0498** |
| | (0.0243) | (0.0208) | (0.0205) |
| Observations | 259527 | 259527 | 259527 |
| Panel B: Single Without Children | | | |
| female | -0.145*** | -0.179*** | -0.173*** |
| | (0.0173) | (0.0180) | (0.0188) |
| conc index | 0.115*** | 0.0739** | 0.0783** |
| | (0.0194) | (0.0259) | (0.0252) |
| femaleXconc index | -0.0359* | -0.0314 | -0.0279 |
| | (0.0210) | (0.0211) | (0.0208) |
| Observations | 72299 | 72299 | 72299 |
| Panel C: Married With Children | | | |
| female | -0.284*** | -0.318*** | -0.307*** |
| | (0.0205) | (0.0188) | (0.0200) |
| conc index | 0.113*** | 0.0689** | 0.0797** |
| | (0.0255) | (0.0244) | (0.0264) |
| femaleXconc index | -0.0829** | -0.0693** | -0.0629** |
| | (0.0299) | (0.0243) | (0.0246) |
| Observations | 108810 | 108810 | 108810 |

Notes: Standard errors in parentheses. * $p < .10$, ** $p < .05$, *** $p < .001$. Data are from 2003-2014 ATUS-CPS files. CPS data includes all individuals in the final interview month selected to participate in the ATUS and members of their households. The sample includes 18-65 year old workers who reported usual weekly hours $\geq$35 and had positive weekly earnings. "Concentration Index" is measured for 94 occupations and is the Herfindahl index of the share of hours worked in each day of the week/hour of day interval. The tables report coefficients from regression of log weekly earnings on female dummy, concentration index and the interaction term. Additional controls include a quartic in age, log weekly hours on the main job, education dummies, race dummies, and year dummies. Column (2) includes the average education level in the occupation as additional control. Column (3) also includes the share of workers in the occupation who work more than 50 hours per week. Standard errors are clustered at the occupation level.

Table A.4: Work among Fulltime Working Men With Working Spouses

| | Weekday | Weekend | Weekday | Weekday | | |
|---|---|---|---|---|---|---|
| Gap in Work Hours by Wifemore | -0.240* | 0.105 | -0.226* | -0.206 | -0.177 | -0.196 |
| | (0.133) | (0.137) | (0.133) | (0.134) | (0.132) | (0.151) |
| Observations | 4061 | 4099 | 4061 | 4061 | 4061 | 2702 |
| Day of Week and Year | | | x | x | x | x |
| Education ,Age and Race | | | | x | x | x |
| Usual Weekly Hours | | | | | x | x |
| Usual Weekly Hours less than 50 | | | | | | x |
| Average Hours, Men | 7.837 | 1.976 | | | | |
| Average Hours, Women | 7.597 | 2.081 | | | | |
| Average Hours, Total | 7.780 | 2.001 | | | | |

Notes: Data are from 2003-2014 American Time Use Surveys (ATUS). The table is based on 18-65 year old male workers who reported to be working fulltime in the activity summary file who have working spouses. "Work" corresponds to minutes spent on "work and work-related activities" at each hour based on starting and ending times in the time diary data. Each column reports the coefficient on "female" dummy with various additional controls. Column (5) controls for usual weekly hours worked reported on the activity summary file. Column (6) only includes workers who reported usual weekly hours less than 50.

Table A.5: Household Care among Fulltime Working Men With Working Spouses

| | Weekday | Weekend | Weekday | | Weekday | | |
|---|---|---|---|---|---|---|---|
| Gap in Household Hours by Wifemore | 0.0772 | 0.0223 | 0.0782 | 0.0912* | 0.0869* | 0.0382 | 0.0394** |
| | (0.0477) | (0.0647) | (0.0479) | (0.0466) | (0.0465) | (0.0588) | (0.0181) |
| Observations | 4061 | 4099 | 4061 | 4601 | 4061 | 2702 | 4061 |
| Day of Week and Year | | | x | | x | x | x |
| Education ,Age and Race | | | | | x | x | x |
| Usual Weekly Hours | | | | | | x | x |
| Usual Weekly Hours less than 50 | | | | | | | x |
| Average Hours, Men | 0.586 | 0.497 | | | | | |
| Average Hours, Women | 0.624 | 0.480 | | | | | |
| Average Hours, Total | 0.595 | 0.493 | | | | | |

Notes: Data are from 2003-2014 American Time Use Surveys (ATUS). The table is based on 18-65 year old male workers who reported to be working fulltime in the activity summary file who have working spouses. "Work" corresponds to minutes spent on "work and work-related activities" at each hour based on starting and ending times in the time diary data. Each column reports the coefficient on "female" dummy with various additional controls. Column (5) controls for usual weekly hours worked reported on the activity summary file. Column (6) only includes workers who reported usual weekly hours less than 50.