

Unpaid Work at Home

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Abstract

A substantial number of people take work home without a formal payment arrangement. Using the Work Schedules and Work at Home Supplement to the May 2001 Current Population Survey, this paper investigates the determinants of unpaid work at home. Education, lack of overtime rates, being a team leader, efficiency wages, and larger earnings inequality in an occupation are positively related to the prevalence of unpaid work at home. Unpaid work at home appears to be a form of investment made in expectation of a return in the long run.

Introduction

The widespread availability of personal computers and Internet connections during the last decade seems to have created additional opportunities for many people to work at home. Indeed, in May 2001, 19.8 million persons—15 percent of the total work force—worked at home at least once per week (U.S. Bureau of Labor Statistics 2002). Whereas some people are paid for their work at home, many other people take work home without a formal arrangement to be paid for it. Thus for some workers working at home represents another perk of flexibility in workplace, while for others it simply means doing more work without getting paid for it. The issue of working at home then involves, beyond the simple question of location of work, unpaid overtime work.

Considering that getting paid for work is the main—if not only—reason for working, the phenomenon of many people working hard at home without getting paid calls for explanation. The lack of appropriate data, however, has prevented any assessment of working at home from this perspective. In the Decennial Census data—the most frequently used data in research on working at home (for example, Kraut and Grambsch 1987; Edwards and Field-Hendrey 2001, 2002; Oettinger 2004), people working at home are identified based on a question about how they usually commute to work. Consequently, the census data omit both people who work at home only occasionally and people who work at home after a day's work in the workplace or on weekends; furthermore, no information is available about pay status. In the studies that used the recent Current Population Survey data (Schroeder and Warren 2004; Weeden 2005; Golden 2008), working at home has been generally treated as a simple matter of flexibility in location of work, and information on the pay status of at-home work, though available, has not been fully explored, except that Weeden (2005) analyzed the effect of unpaid at-home work on wages. The

novelty of this paper lies in the fact that it analyzes unpaid work at home from the perspective of unpaid overtime work. Using the Work Schedules and Work at Home Supplement to the May 2001 Current Population Survey (CPS), this paper contributes to the literature on working at home by investigating the determinants of unpaid work at home.

Reasons for Working at Home by Pay Status

The reasons for working at home would vary depending on the pay status of at-home work. In the case of paid at-home work, it is a question of location of work and the following two reasons are relevant. First, if business is conducted from home, people are certainly likely to work at home. Second, factors associated with higher fixed costs of working at an on-site location or with greater potential for household productivity—being married, having children under the age of six or school-aged children, having an elderly person in the household—would increase the probability of working at home among women (Edwards and Field-Hendrey 2001, 2002).

In the case of unpaid at-home work, the issue involves unpaid overtime work, in addition to the location of work. Bell and Hart (1999) provided some explanations for why workers would work unpaid overtime hours. First, unpaid overtime hours may arise if workers have less bargaining power in a situation where *ex post* outcomes of the time necessary to complete tasks may differ from *ex ante* contractual commitments. For this reason, the coverage by union collective bargaining agreements or by overtime pay would decrease unpaid overtime hours.¹ Second, when team production is a major source of the accumulation of firm-specific human capital and positive rent, team leaders may need to provide unpaid working time to maintain the team's performance and remuneration. Thus, being a team leader—a manager or a supervisor—

would significantly increase unpaid overtime. In these first two explanations unpaid overtime results because workers are trying to finish the work.

In addition to finishing the work, there also are other reasons workers would work unpaid overtime hours. Third, as an exchange for the gift of efficiency wages, workers may provide unpaid hours. According to efficiency wage models, workers provide greater work effort and increased productivity in return for above market-clearing wages. As an alternative to greater work effort and increased productivity, workers may work additional hours with the same level of work effort in return for higher wages. Hence, unpaid hours would rise with the hourly wage.² However, considering the findings that wages are affected by work arrangements (Glass 2004; Schroeder and Warren 2004; Weeden 2005), the hourly wage is likely to be endogenous in the equation for unpaid work at home.

Fourth, unpaid overtime work at home may be an investment to increase future earnings. Bell and Freeman (2001) argued that labor supply decisions are forward looking and incentive driven. They showed that, using data from the National Longitudinal Survey of Youth and German Socio-Economic Panel, because greater earnings inequality implies larger marginal changes in earnings from the same extra work, hours worked rise with occupational earnings inequality, measured by the standard deviation of log hourly earnings in an occupation, and longer hours worked raise future wages and promotion prospects. Pannenberg (2005) further showed that, using data from the German Socio-Economic Panel, workers who put in unpaid overtime are in fact paid with higher earnings in the future.³ Therefore, unpaid hours worked at home would increase with the standard deviation of log hourly earnings in an occupation. Fifth, in another context of the forward looking labor supply, workers may provide unpaid overtime work to prevent a job loss. Anger (2005) showed that the risk of unemployment, measured by

regional unemployment rates, drives workers to supply more unpaid extra hours. Hence, the unemployment rate would increase unpaid overtime work.

Data and Basic Patterns

The determinants of unpaid work at home are analyzed using the Work Schedules and Work at Home Supplement to the May 2001 CPS. The CPS is a monthly survey of about 50,000 households representing the civilian population of the United States. It has been the most commonly used source of data on employment and earnings due to its sample being large and nationally representative. The Work Schedules and Work at Home Supplement to the May 2001 CPS asked the respondents who were employed whether they did any work at home as part of their job. From the wage and salary workers who responded affirmatively, information was collected regarding pay status—whether the worker has a formal arrangement with the employer to be paid for the work at home or just taking work home from the job—and reasons for working at home. The CPS data used in this paper are limited to individuals between the ages of 18 and 65 who worked full time as wage and salary workers in nonagricultural jobs. Self-employed workers are excluded. The sample size is 8,171 workers.

Table 1 shows the descriptive statistics for the sample of full-time salary and wage workers from the CPS by at-home working status. In order to test the hypotheses explained in Section 2, the following variables are created in addition to the usual demographic and job characteristics: a dummy for the presence of a business owner in the household; a union dummy; a dummy for an overtime rate; a team-leader dummy; log hourly wage; the standard deviation of log hourly wage in an occupation cell; and state unemployment rates. The presence of a business owner in the household is a proxy for whether or not business is conducted from home. Having

a business owner in the household is likely to increase the possibility that business is conducted from home. Furthermore, even if business is not conducted from home, if the respondent, a wage-and-salary worker, is employed by the business owner living in the same household, job-related assignments can be easily carried over from workplace to home. The union dummy takes the value of 1 if the worker is either a member of a labor union or covered by a union contract. The dummy for an overtime rate takes the value of 1 if the worker is usually paid an overtime rate, such as time and a half or double time, and 0 otherwise. The team-leader dummy takes the value of 1 if the worker is a manager or a supervisor, and 0 otherwise.⁴ The standard deviation of log hourly wage in an occupation cell is calculated for the three-digit level occupations using data from the 1997 through 2001 CPS outgoing rotation groups. The annual unemployment rates by state for the year of 2000 are obtained from the Bureau of Labor Statistics.

In Table 1, about 16 percent of the salary and wage workers worked at home, and most of them—about 12.5 percent of the salary and wage workers—took work home from the job without a formal arrangement, and only about 3.4 percent of the salary and wage workers were paid at-home workers.⁵ Unpaid at-home workers are older and better-educated than any other workers. They are also more likely to be white and non-hourly workers. Surprisingly, unpaid at-home workers are more likely to be covered by union collective bargaining agreements, but are less likely to be covered by overtime rate as expected. They are more likely to be team leaders and have higher hourly wages than other workers. Contrary to the explanations in Section 2, these workers live in the states with relatively lower unemployment rates.

In the May 2001 CPS respondents were also asked to provide the main reason for working at home. According to Table 2, the reasons varied substantially by pay status of at-home work. And the distribution patterns of the reasons for working at home are supportive of

the explanations provided in Section 2. Among people who were taking work home *without* a formal payment arrangement, the majority—about 62 percent—reported that they worked at home to “finish or catch up on work.” An additional 25 percent reported that they worked at home without a formal payment arrangement because it was the “nature of the job.” Reasons such as “business is conducted from home” or “coordinate work scheduled with personal or family needs” are less than five percent, respectively.

Among people who worked at home *with* a formal payment arrangement, in contrast, about 34 percent reported they worked at home because it was the “nature of the job” and only about 22 percent worked at home to “finish or catch up on work.” Furthermore, unlike the case of unpaid work at home, “business is conducted from home” is one of the three main reasons for paid work at home—about 21 percent of the respondents.

Results: Multinomial Logit Estimation

For a detailed examination of the determinants of the probability of working at home by pay status, Table 3 shows the marginal effects from a multinomial logit estimation. Since the workers in the sample fall into one of the three mutually exclusive categories of at-home workers—not work at home, unpaid work at home, and paid work at home, it is necessary to employ the multinomial logit estimation so as to analyze the different probabilities of working at home by pay status. In addition to the reported marginal effects, three region dummies, nine industry dummies, and seven occupation dummies are included in all regressions, but the marginal effects are not reported.

Table 3 clearly illustrates that the determinants of at-home work substantially vary by pay status. First of all, differences between men and women are very small, with women being about

one percentage point more likely to work at home *with* a formal payment arrangement—a statistically significant difference, but there is no gender difference in terms of the probability of working at home *without* a formal payment arrangement, holding other things constant. These results suggest that the findings in Golden (2008) based on the same CPS data that women are significantly more likely to have at-home work is largely due to the fact that he has pooled both paid and unpaid at-home workers into one group of at-home workers.⁶ Although paid work at home is preferred by women because it provides flexibility to manage work-family conflict, unpaid work at home may not be preferred by women because it is just another form of unpaid overtime work extended to home.

The marginal effects of the four educational dummy variables suggest that workers with college and graduate degrees are significantly more likely to do unpaid work at home than the reference group, high school dropouts. For example, having a graduate degree increases the probability of doing unpaid work at home on average by 10 percentage points compared with high school dropouts, holding other things constant. But there is no such difference in the probability of working at home with a formal payment arrangement. Blacks and Hispanics are not different from whites in the probability of working at home, regardless of pay status. The gaps in the probability of working at home observed in Table 1 between whites and these two racial/ethnic groups must have been explained by other demographic and employment characteristics included in the regressions. Interestingly, immigrants are less likely to do paid work at home than natives. This may be because immigrants have limited access to jobs that allow flexibility in location along with a formal payment arrangement. Not surprisingly, workers paid by the hours are significantly less likely to work at home, regardless of pay status.

Consistent with the predictions in Section 2, the presence of a business owner in the household increases the probability of working at home, regardless of pay status. But inconsistent with Edwards and Field-Hendrey (2001, 2002), none of the variables associated with higher fixed costs of working at an on-site location or greater potential for household productivity—being married, having children under the age of six or school-aged children, having an elderly person in the household—are positive and significant. These differences might be due to the differences in the identifications of at-home workers between the Census data and the CPS. Unlike the Census, the CPS sample does not rely on the usual method of commuting to identify at-home workers, and thus include many people who work both at home and in the workplace. For those who work both at home and in the workplace, higher fixed costs of working in the workplace would be less important than for those who work only at home.

Inconsistent with the explanations provided in Section 2, union coverage significantly *increases* the probability of doing unpaid work at home. Considering the findings in Bell and Hart (1999) that union is negatively correlated with unpaid work, this result suggests that there might be a certain degree of substitution between unpaid work in the workplace and unpaid work at home, which is likely to be beyond the reach of union. However, because the Work Schedules and Work at Home Supplement to the May 2001 CPS does not provide information on unpaid work in the workplace, it is not possible to test this conjecture.

Most of the other key variables are supportive of the explanations provided in Section 2. Working in a job that provides an overtime rate significantly decreases the probability of just taking work home. Being a team leader increases the probability of doing unpaid work at home. Consistent with the efficiency wage hypothesis, workers with higher wages put in unpaid overtime hours at home. However, as explained above, because the hourly wage is likely to be

endogenous here, the positive and significant marginal effect of the log hourly wage on unpaid work at home (and also on paid work at home) may be simply reflecting the positive effect of unpaid work at home on wages (Glass 2004; Schroeder and Warren 2004; Weeden 2005). Due both to the cross-sectional nature of the data and to the lack of valid instrumental variables that are correlated with the log hourly wage but uncorrelated with the error term, it is not possible to identify the exact causal effect of the log hourly wage on unpaid work.

Consistent with the concept of the forward looking labor supply (Bell and Freeman 2001; Pannenberg 2005; Anger 2008), more people do unpaid work at home in occupations with higher earnings inequality, measured by the standard deviation of log hourly wage in an occupation cell. Specifically, the probability of doing unpaid work at home rises on average by 1 percentage point, *ceteris paribus*, when the standard deviation of log hourly wage in an occupation cell is increased by 0.1.⁷ Yet, the fact that the marginal effect of the standard deviation of log hourly wage on paid work at home is similarly positive and significant suggests that this positive marginal effect of the standard deviation of log hourly wage on unpaid work at home may be simply capturing certain occupational characteristics that are positively correlated with at-home work, regardless of pay status.⁸ Finally, different from the findings in Anger (2005), there is no evidence that the risk of unemployment, measured by the state unemployment rate, increases the probability of doing unpaid work at home, but higher state unemployment rates significantly lower the probability of doing paid work at home.

The overall findings in this section thus suggest that unpaid overtime work at home is in fact another form of investment made by well-educated managers and supervisors in expectation of higher wages and promotion in the long run. Because these workers are sacrificing for future, unpaid work at home might lower their present well-being. However, Pannenberg and Wagner

(2001) showed that, in the case of Britain, workers with persistent unpaid overtime were more satisfied with their job than other workers without overtime. Thus, unpaid overtime work at home does not necessarily diminish a worker's well-being.

Conclusions

Using the May 2001 CPS, this paper has contributed to the literature on work at home by investigating unpaid work at home from the perspective of unpaid overtime work. The findings in this paper indicate that in addition to education, lack of overtime rates, being a team leader, efficiency wages, and larger earnings inequality in an occupation are all positively related to the prevalence of unpaid overtime work at home. Contrary to the previous research, however, being married, having children, and having an elderly person in the household do not increase the probability of working at home, regardless of pay status. Overall, unpaid work at home appears to be a form of investment made in expectation of a return in the long run.

Because of the cross-sectional nature of the CPS data and the lack of valid instrumental variables, the effects of some variables—for example efficiency wages and earnings inequality—on unpaid work found in this paper are essentially pointing out association, not causality. Further research based on either longitudinal data or using valid instrumental variables would be fruitful in examining causality.

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Notes

¹ The overtime pay provisions of the Fair Labor Standards Act require that covered workers be paid an overtime wage of at least one and one-half times an employee's regular rate of pay after 40 hours of work in a workweek. Trejo (1993) showed that unions increase the prevalence of overtime pay and decrease the likelihood of working overtime.

² Bell and Hart (1999) provided two more explanations for unpaid overtime work. First, if employers have imperfect information about the productivity of individual workers, they may allocate a task with a fixed hourly rate of pay through an explicit auction among workers. Low-productivity workers then can under-bid more productive workers as long as the value of the actual time required to complete the task exceeds the value of their outside alternative, but they are likely to do unpaid overtime work. Thus, productivity is negatively associated with unpaid hours. As a proxy for productivity, Bell and Hart employed the deviation of the individual's hourly wage from the mean occupational wage. Because this measure of productivity is highly correlated with the hourly wage, I cannot separately identify the effect in this paper. Second, unpaid overtime may be undertaken by workers already working paid overtime as a way to offset exogenous constraints on the cost and timing of paid overtime. Bell and Hart thus expected that employees who worked paid overtime are more likely to work unpaid overtime, but their empirical results based on the UK Labour Force Survey for 1993/94 were opposite to their expectations.

³ In addition to the investment character of unpaid overtime work, Anger (2008) provided an explanation based on a signaling model for the positive effect of unpaid overtime work on earnings.

⁴ Using the 3-digit occupation codes from the 1980 Standard Occupation Classification, the following occupations of managers/supervisors are coded as team leaders: 7 through 22, 243, 303, 304, 305, 306, 307, 413, 414, 415, 433, 448, 456, 503, 553, 554, 555, 556, 557, 558, 613, 628, 803, 843, and 864.

⁵ All the reported results are weighted using the final weight available in the 2001 May CPS.

⁶ Another reason might be while this paper analyzes full-time workers only, Golden included part-time workers, which often include more female at-home workers.

⁷ The minimum and the maximum for the standard deviation of log hourly wage in an occupation cell in the sample are .26 and .99, respectively.

⁸ For example, it is possible that internally fragmented occupations have both large wage inequalities and a wide range of work contracts and institutional arrangements within them, including paid/unpaid work at home. I am grateful to an anonymous referee for pointing this out.

Table 1
Descriptive Statistics of the Sample

	Not work at home	Unpaid work at home	Paid work at home
Proportion in the sample	.841	.125	.034
Female	.444	.496	.513
Age	39.08	41.87	40.63
Less than high school	.103	.009	.050
High school	.361	.095	.148
Some college	.300	.164	.265
College	.178	.431	.412
More than college	.057	.301	.126
White	.701	.851	.758
Black	.126	.070	.090
Hispanic	.124	.051	.080
Other	.050	.028	.072
Immigrant	.136	.082	.068
Paid hourly	.623	.141	.252
MSA	.820	.898	.865
Married	.564	.688	.698
Someone in the household owns a business	.070	.120	.145
Age of youngest child: under 6	.175	.158	.195
Age of youngest child: 6-17	.223	.251	.283
Related persons over 65 in the household	.077	.072	.048
Union	.167	.209	.094
Overtime rate	.220	.035	.131
Team leader	.163	.305	.250
Log hourly wage	2.63	3.03	2.97
Standard deviation of log wage in occupation cell	.455	.499	.509
Unemployment rate	3.99	3.92	3.99
Number of observations	6,861	1,039	271

Note: Reported numbers are weighted results from the 2001 May CPS.

Table 2
Reason for Working at Home by Pay Status

	Unpaid	Paid
Finish or catch up on work	.617	.222
Business is conducted from home	.022	.209
Nature of the job	.251	.340
Coordinate work schedule with personal or family needs	.042	.086
Reduce commuting time or expense	.012	.049
Local transportation or pollution control program	0	.007
Some other reason	.056	.088

Note: Reported numbers are weighted proportions from the 2001 May CPS.

Table 3
Multinomial Logit Estimates of the Determinants of the Probability of At-home Work by Pay status, Marginal Effects at the Mean

	Not work at home	Unpaid work at home	Paid work at home
Female	-.008 (.005)	.001 (.004)	.008** (.003)
Age	-.005* (.002)	.002 (.002)	.003** (.001)
Age squared	.00005* (.00002)	-.00002 (.00002)	-.00004** (.00001)
High school	.000 (.020)	.012 (.020)	-.012* (.005)
Some college	-.016 (.023)	.023 (.022)	-.007 (.005)
College	-.072* (.034)	.073* (.034)	-.001 (.006)
More than college	-.095* (.048)	.102* (.048)	-.007 (.005)
Black	.005 (.009)	-.008 (.007)	.002 (.005)
Hispanic	.006 (.011)	-.011 (.008)	.005 (.006)
Other	.018 (.011)	-.030** (.006)	.013 (.009)
Immigrant	.015 (.009)	-.002 (.009)	-.013** (.003)
Paid hourly	.064** (.008)	-.050** (.007)	-.013** (.004)
MSA	-.019** (.006)	.019** (.005)	.001 (.004)
Married	-.011 (.006)	.006 (.005)	.005 (.003)
Someone in the household owns a business	-.029** (.011)	.019* (.009)	.010 (.006)
Age of youngest child: under 6	-.003 (.008)	.000 (.007)	.003 (.004)
Age of youngest child: 6-17	-.005 (.007)	.002 (.006)	.002 (.003)
Related persons over 65 in the household	.005 (.009)	.001 (.008)	-.006 (.004)
Union	-.023** (.008)	.024** (.007)	-.001 (.005)
Overtime rate	.022** (.008)	-.029** (.006)	.007 (.005)

Team leader	-0.013 (.009)	.016* (.008)	-.003 (.004)
Log hourly wage	-.018** (.006)	.011* (.005)	.007* (.003)
Standard deviation of log wage in occupation cell	-.216** (.048)	.104** (.037)	.112** (.025)
Unemployment rate	.002 (.004)	.002 (.003)	-.004* (.002)
Pseudo R-square		.265	
Number of observations		8,171	

Note: The reported regressions also include three region dummies, nine industry dummies and seven occupation dummies. The numbers in parentheses are standard errors. The regressions were weighted using the final weight available in the 2001 May CPS.

* Statistically significant at the .05 level. ** Statistically significant at the .01 level.