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# Work Hours Constraints:
# Impacts and Policy Implications

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# ABSTRACT

# Work Hours Constraints: Impacts and Policy Implications[*]

If individuals reveal their preference as consumers, then they are taken seriously. What happens if individuals, as employees, reveal their preferences in working hours? And what happens if there is a misalignment between actual hours worked and preferred hours, the so-called work hours constraints? How does this affect the productivity of workers, their health, and overall life satisfaction? Labor supply and corresponding demand are fundamental to production. Labor economists know for long that the fit of a worker in a job and the matching of skills to the assigned employment are of paramount importance; they guarantee high productivity, quality output, and individual happiness. Employees demand higher social awareness and a working environment where they feel useful and happy. The evidence shows that discrepancies between preferred hours of work and actual hours of work can have serious detrimental effects on workers, perverse effects on labor supply with unintended direct ramifications on the labor market and indirect implications on the goods and services markets. The sooner employers acknowledge and address working hours constraints the faster we can build work lives that make us better off.

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The political, social and economic debate has, so far, been polarized along the lines of persistent high unemployment, the steadily increasing number of atypical workers, rising poverty, demand for minimum wages, and the balance between work and family. While numerous studies show that for many workers the desired working hours do not coincide with their actual working hours, little attention has been paid to the working time preferences of employees. In fact, there is considerable discrepancy between actual working hours and desired or preferred hours of work; this gap is referred to in the literature as *working hours constraints*. In many industrialized countries such as the U.S., Japan, France, Germany, Spain and Russia more than 30% of workers endure working hours constraints. Furthermore, in some countries such as Germany, France and Portugal working hours constraints have even increased over the past decades (Otterbach, 2010). Data from the German Socio-Economic Panel (GSOEP) show that in Germany less than half of the employees are satisfied with their actual hours worked, including overtime (see figure 2).

Over the last hundred years, working hours have been steadily decreasing in the industrialized world. In recent years, however, this decline has slowed down considerably in almost all OECD countries and has even come to a halt in some countries. In the U.S., working hours have, in fact, increased again lately (Sousa-Poza and Henneberger, 2000). Working hours have also increased in Germany especially when accounting for unpaid overtime (Anger, 2006). More than half of all workers and about two-thirds of full-time employees work overtime regularly (Brenke, 2004). Currently, employers in both the public and private sectors use unpaid overtime as a means to reduce labor costs (Grözinger et al., 2008).

Figure 1 illustrates compensation forms for overtime work (that is, in excess of contractual working hours) based on the GSOEP and spanning from 1992 to 2008. There are three types of compensation: paid, unpaid, a combination of monetary pay and time off, and compensation via free time. Evidently, not only is monetary compensation for overtime the least prevalent form of compensation, but it is also shrinking over time. While in 1992 17% of employees received monetary compensation for overtime work, in 2008 only 10% of employees were monetarily compensated for it. On the other hand, the proportion of workers, whose overtime work is not compensated at all, has increased from 14% in 1992 to 21% in 2008. During the same period, overtime compensation through time off increased by 14 percentage points (from 30% in 1992 to

49% in 2008). Interestingly, the mixed form of payment for overtime decreased by 14 percentage points, going from 34% to 20%.



Figure 1: Overtime Compensation in Germany
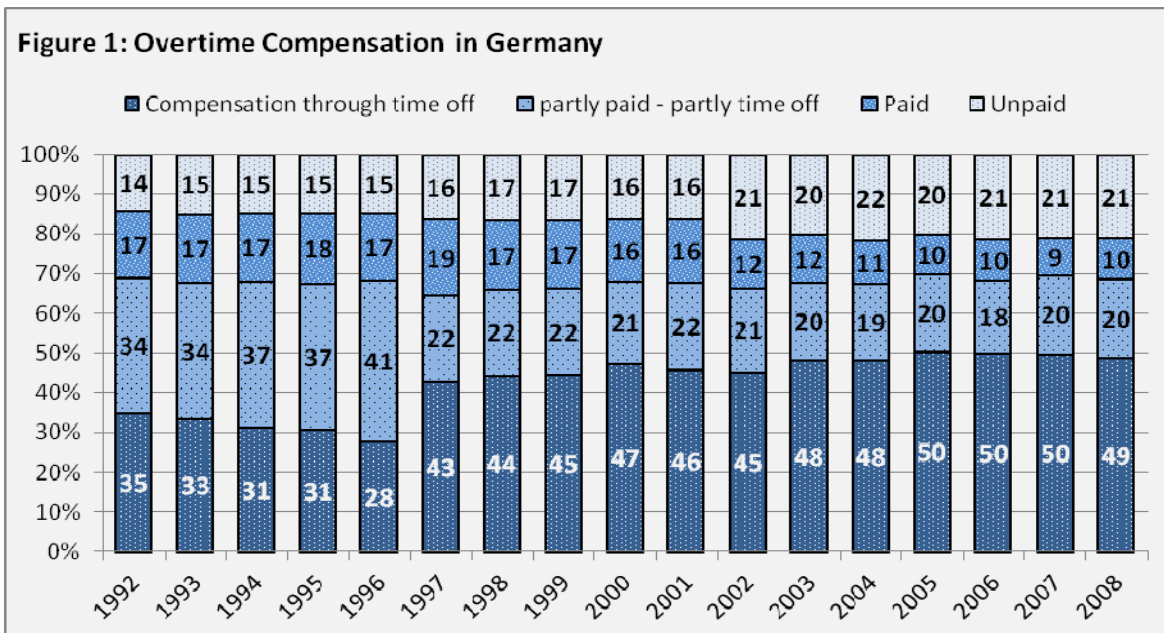
Hence, employees are highly flexible with regard to working hours (Brenke, 2004) and are even willing to accept unpaid overtime work. While this sounds counterintuitive and against what we have learnt and preached as economists (that is, incentives make people work and people are paid according to performance) some studies claim that it can be true. In behavioral tests that Ariely et al. (2009) conducted, they found that for jobs that are more mechanical in nature larger rewards increased performance. However, in jobs in which even rudimentary cognitive skills were required higher monetary rewards decreased performance. As if a high monetary reward stifles creativity and enthusiasm. If pay is not a significant driver of motivation and enthusiasm of the worker, then it must be non-pecuniary factors that affect employees' motivation, engagement and commitment. For example, if employees are free to choose the hours they want to work and feel in charge of their time so that they do not work overtime or undertime they can be much more productive, happy, and have a sense of fulfillment; this can make for a standout workplace that attracts the brightest workers. In this scenario, trust is the key differentiator.

Moreover, Anger (2006) showed that in Germany, large parts of earned leisure time and booked to working time accounts (Arbeitszeitkonten) are not claimed by employees, and even vacation

days are not entirely used by employees (Sabarowski et al., 2004);[1] job insecurity is the prime reason of this. It is therefore not surprising that more than half of the employees are not satisfied with the length of their working hours. Figure 2 displays the evolution of work hours constraints in Germany from 1992 to 2008. In 2008, 44% of workers stated that they prefer working at least 4 hours less per week than their current working hours, and were even willing to forgo earnings. The share of these over-employed workers was 39% in 1992. During the same period (1992-2008), the share of under-employed people who are willing to work at least 4 more hours per week than they currently do, increased from 6% to 13%. On the other hand, the proportion of employees who are happy with their hours-/wage-combination, decreased from 55% to 43%. Interestingly, full-time employees want fewer working hours whereas part-time workers, mostly women in East Germany, want to work more hours to increase their earnings and financial position (Holst, 2009).



Figure 2: Work Hours Constraints in Germany

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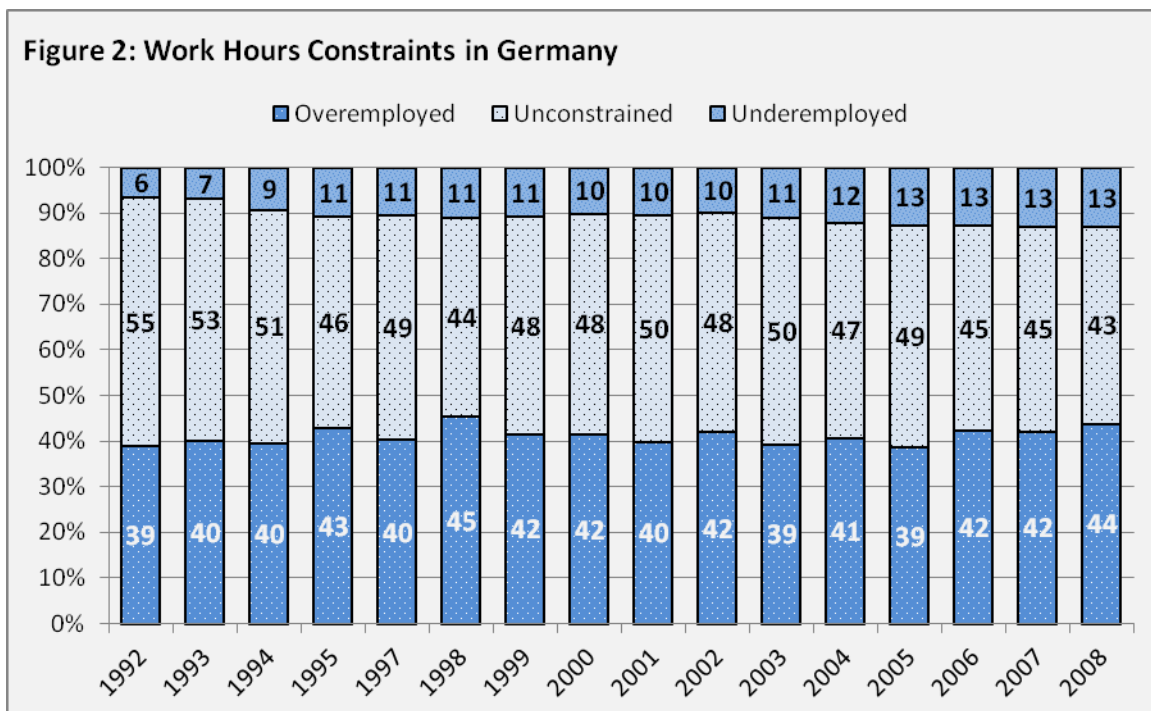
[1] This phenomenon of earned but unclaimed time off occurs in other countries as well. In a recent survey by Expedia (Expedia's Vacation Deprivation online survey polled 7,803 workers and 20 countries), it is found that the average American worker earned 14 vacation days in 2011, but will only take 12. Two forfeited days of vacation results in 226 million of unused vacation days for the total working population. Multiplied by the average full-time worker's salary, this amounts in $34.3 billion in forfeit vacation days. The most common reasons for not claiming time off are "cannot afford to travel," "lack of planning," "worry that being out of the office might make them the next on the list." In Japan, according to the same survey workers earned 11 days a year and used only five (http://money.cnn.com/2011/11/30/pf/unused_vacation/index.htm).

It is worth noting that respondents explicitly highlight their willingness to adjust their earnings according to their preferred working hours. Yet, little is known about how workers who do not receive any compensation for overtime work at all would respond to this question; particularly because compliance with the contractually agreed working hours would generally tend to converge towards the desired working hours (Holst, 2009).

The obvious questions that arise are: why does this discrepancy exist between actual and preferred hours of work, can individuals as suppliers of labor communicate their preferences to the employers and the policymakers, and what are the effects of working hours constraints on the labor market and the health of individuals? In the next section we provide an overview of the reasons that cause the discrepancy between actual and desired hours of work.

**Causes of Work Hours Constraints**

According to neoclassical theory individuals maximize utility subject to a budget constraint, and can freely choose their preferred working hours. Under perfectly competitive markets with rationale agents and full information, actual and preferred hours worked should be the same. Both theory and empirical evidence show, however, that individuals are not free to choose their working hours, resulting in a divergence between actual and preferred hours worked. Relevant literature offers some explanations for this misalignment; notably, long-term contracts, fixed wages (Kahn and Lang, 1996), job insecurity (Stewart and Swaffield, 1997), poor matching (Altonji and Paxson, 1988), government regulations and taxes (Rottenberg, 1995) and asymmetric information regarding the productivity of employees (Sousa-Poza and Ziegler, 2003; Landers, Rebitzer and Taylor, 1996) are some of the rigidities in real life situations. On top of these possible reasons, working hours constraints also offer a significant justification that causes disutility.

At the other end of neoclassical theory, Sen (1977) in his avant-garde piece about the rational egoistic man of Edgeworth talked about psychological issues that underlie choice and relate to consumer decisions and production activities. He introduced the concepts of sympathy and commitment as part of the utility maximizing function, arguing that commitment as part of

behavior can result in nongains-maximizing answers, even when answers are truthful. This is along the strand of literature that places identity, behavior and personality traits in the heart of labor markets and the performance of individuals. It may very well explain why some people would rather get a pay-cut than work more. Akerlof and Kranton (2005) envisage corporate culture as the division of the workers into different groups, the prescribed behavior for each group and the extent to which workers identify with the organization or with the workgroup and adopt their respective goals. They argue that identity is an important supplement to monetary compensation and enterprises that inculcate in employees a sense of identity and attachment to an organization are well functioning. In other words, desired hours of work become irrelevant.

Next, we proceed to examine the effects of work hours constraints on individuals and the labor markets in several countries.


**Effects of Work Hours Constraints**

The textbook theory of labor supply posits that rational agents decide how many hours they should work depending on market wages. Individuals constantly face a trade-off between work and leisure as they try to allocate their time. If they supply more labor, they have less time to enjoy life and if they supply less labor they have less money to enjoy life. There is an optimum amount of work that provides individuals with enough compensation for them to enjoy their leisure time.

Boheim and Taylor (2004) examine the impact of work hours constraints on job mobility and changing work hours behavior. Using data from the British Household Panel Survey (BHPS), they find that over and underemployed women are more likely to adjust their work hours in line with their preferences if they change job and employer than if they remain in the same job with the same employer. Likewise, this finding also holds for men, but only with respect to a change of employer. In particular, overemployed women are even more likely to exit the labor market completely. The authors conclude that these rigidities in the labor market impair the welfare of both employees and employers. Similar patterns of labor market behavior are found in a study for the Netherlands (Euwals, 2001).

Based on the first five waves of the Household, Income and Labour in Australia (HILDA) data Wooden, Warren and Drago (2009) find that lack of alignment between actual and preferred working hours affects the subjective well-being of workers. In particular, the study reveals that work hours constraints and, above all, over-employment have a significant and negative effect on job and life satisfaction whereas the number of hours worked per se only marginally affects these measures. Similarly, in another empirical work based on GSOEP cross-sectional data Grözinger et al. (2008) confirm that work hours constraints have negative effects on job and life satisfaction, as well as health satisfaction. This study, however, does not explicitly differentiate between over- and under-employed workers.

While money does not always buy happiness, happiness is inextricably and directly linked to one's health. Individuals who report high work satisfaction and high life satisfaction are not only happier, but also healthier. Steptoe et al. (2005) using a subset of 216 participants in the so-called Whitehall II study, provide support of this correlation. The Whitehall II study is a cohort survey of about 10,000 employees established in 1985 by the British authorities. In the study, the subjects were interviewed 33 times per working day, on average, about their state of happiness during the last 5 minutes. The study revealed an inverse relationship between the specified level of happiness of the individual and the concentration of the individual's stress hormone cortisol. Cortisol is a known harmful hormone, generally closely related to diabetes, high blood pressure and hyperglycemia.

Numerous studies in other fields such as epidemiology, organizational psychology and health have shown the direct correlation between the number of working hours and health. Another recent paper based on data from the Whitehall II study finds that 3 to 4 hours of overtime work per day is associated with 1.60-fold increased risk of heart disease (mainly risk of heart attack and angina pectoris also known as chest tightness) compared to employees with no overtime work (Virtanen et al., 2010).

Although these studies show a negative relationship between long working hours and health, they are still limited in their explanatory power. They are often based on small sample sizes, look at only specific occupational groups or are based on cross-sectional data. Another limitation is

that the working time preferences of employees are not considered. There is no indication of whether individuals can freely choose their working hours or they face working hours constraints; although there is a potential for the endogenous relationship between health and working hours (Spurgeon, 1997).


**Fixed Effects Estimations Results: Germany and the UK**

The GSOEP provides some subjective health variables such as satisfaction with one's own health and self-assessed health status, which are found to be correlated with some objective health variables (Jylhä, 2009). Based on GSOEP data from 1992 to 2008, Bell et al. (2011) analyze how working hours constraints affect workers´ health. The independent variable of interest is an interaction variable between workload categories and the incidence of work hours constraints, that is, whether workers are overemployed, underemployed or unconstrained. The authors estimate multivariate fixed-effects regression models and control for a rich set of socioeconomic characteristics. Table 1 presents the authors´ estimation results for the entire sample, and disaggregated by gender.

In general, regardless of the number of hours worked, being overemployed renders workers less satisfied with their health when compared to their full-time counterparts whose actual working hours are between 35 to 40 hours per week, and whose actual work time is consistent with their preferred working hours (the reference category). The exception is men who work between 20 and 35 hours per week. Likewise, overemployment has a general negative effect on self-assessed health for the full sample and the female sub-sample. For overemployed men this effect appears only if their actual work hours exceed 35 hours per week. A possible explanation for these gender differences could be that women face more binding time constraints due to family care and household responsibilities. Thus, their adverse effects may occur across the entire band of actual hours worked whereas for men these effects are not significant if actual work hours are short (Bell et al., 2011). Another interesting result with respect to self-assessed health is that underemployment also seems to be a severe problem especially among German men. Underemployed men with a workload of <20, 20-34, 41-49, and 50+ hours per week show

evidence of a lower general health status than the reference category. For women this is the case only if work hours are less than 20 per week.

**<<<Table 1 about here>>>**

Moreover, Bell et al. (2011) also assess the impacts of work hours constraints on health satisfaction and self-assessed health for the UK. Using the British Household Panel Survey (BHPS) they find similar results as for Germany with detrimental effects of overemployment on workers´ health in several workload categories. The BHPS, also a national representative and longitudinal dataset, has two additional variables that describe the mental health of respondents. Specifically, people were asked how often they have been unhappy or depressed lately, and whether they felt being under permanent stress. In this study, we estimate a fixed-effects model using the BHPS waves from 1991 to 2007. Again, the dependent variable of interest is an interaction variable between workload categories and the incidence and direction of work hours constraints. Table 2 presents the results of these regressions, which are run for the entire sample, and for a male and female sub-sample, separately.

**<<<Table 2 about here>>>**

For the depression variable (columns 1, 2, and 3), we find significantly negative effects for all workload categories in the full sample, a finding that also holds for the female subsample except when actual work hours are between 41 and 49 hours per week. Additionally, in the male sample, overemployed workers whose workload is in the categories above 35 hours per week are more frequently affected by unhappiness and depression compared to the reference category of unconstrained full-time workers with weekly work hours between 35 and 40 hours.

For the stress variable, the regression results reveal a very clear picture: consistently, throughout both the full sample and the subsamples, we find significantly negative effects of overemployment on stress. That is, overemployed workers are more frequently under constant strain than unconstrained workers with actual weekly work hours between 35 and 40 hours.

The results of the fixed-effects regression models, reported in Table 2, clearly show that mental health is also negatively influenced by overemployment, meaning that it aggravates depression

and makes people feeling sad, angry, frustrated and miserable. Interestingly, for women who are in the workload categories of less than 40 hours per week, we find that underemployment is harmful and adds negatively to their depression. For underemployed men this is also the case if they work between 20 to 35, and 35 to 40 hours per week.

**Conclusions**

Analyzing and understanding work hours constraints is of paramount importance for the smooth functioning of the labor markets as well as it is crucial for the social, political and economic debate. Any labor market and working time policy aimed at reconciling work and family life, at achieving a better work-life balance, or at increasing job satisfaction, should take a closer look at the discrepancy between individual working hours preferences and the actual hours worked. The analysis of work hours constraints encompasses essential information for determining the need for part-time positions as well as the labor supply behavior of individuals and the changing behavior of employees. Such an analysis not only improves the understanding of individual labor supply decisions, but also sheds light on how individuals adjust their labor supply at times of loosen or exacerbating work hours constraints (Wolf, 1998; Wolf, 2000).

From an employer's point of view, taking into consideration working time preferences could be extremely beneficial. It might help reduce labor mobility costs due to employees' within- and between-employer job changes (high turnover costs). It can also help employers facilitate and ease employees' re-entry after parental leave. Moreover, working hours constraints could be decisive in attracting highly skilled labor. They serve as a measure of welfare in the workplace and life satisfaction, and can also influence the overall health of workers and their morale. Strategies that reduce the mismatch between actual and desired working hours, could help boosting workers' motivation and productivity as well as reducing absenteeism and associated missed days of work. From the government's angle, insights into preferred hours of work may help the design of tax-benefit programs and subsidies.

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**Table 1: GSOEP – Fixed-effects Model**

| | Health Satisfaction | | | Self-assessed Health | | |
|---|---|---|---|---|---|---|
| | Total (1) | Men (2) | Women (3) | Total (4) | Men (5) | Women (6) |
| < 20 hours: underemployed | -0.044 | -0.107 | -0.038 | **-0.038\*\*\*** | **-0.052\*** | **-0.044\*\*** |
| <20 hours: no restrictions | -0.033 | 0.079 | -0.057 | -0.024 | 0.007 | **-0.038\*\*** |
| <20 hours: overemployed | **-0.303\*\*\*** | **-0.427\*** | **-0.300\*\*\*** | **-0.111\*\*\*** | -0.082 | **-0.125\*\*\*** |
| 20-35 h: underemployed | 0.009 | -0.080 | 0.017 | -0.007 | **-0.056\*\*** | -0.002 |
| 20-35 h: no restrictions | -0.032 | 0.037 | -0.048 | **-0.022\*** | **-0.060\*\*** | **-0.024\*** |
| 20-35 h: overemployed | **-0.154\*\*\*** | -0.122 | **-0.170\*\*\*** | **-0.080\*\*\*** | -0.056 | **-0.088\*\*\*** |
| 35-40 h: underemployed | -0.008 | -0.011 | -0.009 | 0.014 | 0.010 | 0.021 |
| 35-40 h: overemployed | **-0.098\*\*\*** | **-0.088\*\*\*** | **-0.107\*\*\*** | **-0.048\*\*\*** | **-0.049\*\*\*** | **-0.049\*\*\*** |
| 41-49 h: underemployed | -0.033 | -0.088 | **0.240\*** | -0.029 | **-0.058\*\*** | **0.128\*\*** |
| 41-49 h: no restrictions | -0.002 | -0.007 | 0.019 | -0.007 | -0.008 | 0.003 |
| 41-49 h: overemployed | **-0.096\*\*\*** | **-0.089\*\*\*** | **-0.105\*\*\*** | **-0.046\*\*\*** | **-0.036\*\*\*** | **-0.061\*\*\*** |
| 50+ h: underemployed | -0.007 | -0.063 | 0.397 | **-0.083\*\*** | **-0.081\*\*** | -0.030 |
| 50+ h: no restrictions | 0.004 | -0.002 | 0.118 | -0.019 | -0.013 | -0.006 |
| 50+ h: overemployed | **-0.092\*\*\*** | **-0.068\*\*\*** | **-0.152\*\*\*** | **-0.052\*\*\*** | **-0.037\*\*\*** | **-0.082\*\*\*** |
| Constant | **9.240\*\*\*** | **9.489\*\*\*** | **9.074\*\*\*** | **4.829\*\*\*** | **5.132\*\*\*** | **3.369\*\*\*** |
| Number of observations | 127,017 | 68,332 | 58,685 | 127,071 | 68,351 | 58,720 |
| F | 49.601 | 33.331 | 18.316 | 60.959 | 40.785 | 22.866 |
| $R^2$ | 0.067 | 0.078 | 0.056 | 0.092 | 0.106 | 0.081 |

<u>Note</u>: *** $p<0.01$, ** $p<0.05$, * $p<0.1$

The dependent variables are health satisfaction and self-assessed health, respectively.

Model also includes socioeconomic control variables for age, tenure, marital status, number of children, net wages, household income, the grade of disability, unpaid overtime, wave dummies, and dummies for 2-digit occupational codes.

Data: GSOEP | Source: Bell, Otterbach, Sousa-Poza (2011)

**Table 2: Fixed-effects Model: Health Status in the UK**

| | Depression | | | Stress | | |
|---|---|---|---|---|---|---|
| | **Total** **(1)** | **Men** **(2)** | **Women** **(3)** | **Total** **(4)** | **Men** **(5)** | **Women** **(6)** |
| < 20 hours: underemployed | **-0.053*** | -0.020 | **-0.070*** | 0.006 | 0.033 | -0.012 |
| <20 hours: no restrictions | -0.005 | 0.003 | -0.018 | 0.010 | 0.019 | -0.003 |
| <20 hours: overemployed | **-0.090*** | -0.027 | **-0.114*** | **-0.069*** | **-0.131**** | **-0.074*** |
| 20-35 h: underemployed | **-0.082*** | **-0.083**** | **-0.094*** | 0.003 | **0.085**** | -0.034 |
| 20-35 h: no restrictions | **-0.031*** | 0.036 | **-0.057*** | 0.010 | **0.070*** | -0.015 |
| 20-35 h: overemployed | **-0.102*** | -0.038 | **-0.127*** | **-0.113*** | **-0.093**** | **-0.133*** |
| 35-40 h: underemployed | **-0.070*** | **-0.055*** | **-0.117*** | **-0.028**** | -0.018 | **-0.053*** |
| 35-40 h: overemployed | **-0.084*** | **-0.083*** | **-0.090*** | **-0.105*** | **-0.090*** | **-0.126*** |
| 41-49 h: underemployed | 0.003 | 0.007 | 0.002 | -0.037 | -0.036 | -0.027 |
| 41-49 h: no restrictions | 0.021 | 0.025 | 0.019 | -0.001 | -0.003 | 0.025 |
| 41-49 h: overemployed | **-0.055*** | **-0.065*** | -0.023 | **-0.098*** | **-0.089*** | **-0.110*** |
| 50+ h: underemployed | 0.032 | 0.026 | 0.428 | -0.092 | -0.101 | 0.602 |
| 50+ h: no restrictions | -0.010 | -0.022 | 0.095 | **-0.069*** | **-0.063*** | -0.054 |
| 50+ h: overemployed | **-0.073*** | **-0.067*** | **-0.083**** | **-0.172*** | **-0.154*** | **-0.206*** |
| Constant | **4.497*** | 2.498 | **5.004*** | **4.502*** | 3.201 | 4.677*** |
| Number of observations | 98,681 | 47,183 | 51,498 | 98,692 | 47,187 | 51,505 |
| F | 5.414 | 3.089 | 3.563 | 10.039 | 5.819 | 6.055 |
| $R^2$ | 0.000 | 0.001 | 0.000 | 0.001 | 0.026 | 0.002 |

<u>Note</u>:  *** $p<0.01$, ** $p<0.05$, * $p<0.1$

The dependent variables are unhappiness/depression and stress, respectively.

Model also includes socioeconomic control variables for age, tenure, marital status, number of children, net wages, household income, the grade of disability, unpaid overtime, wave dummies, and dummies for 2-digit occupational codes.

Data: BHPS | Own calculations