

Pannenberg, Markus

Working Paper

Long - Term Effects of Unpaid Overtime: Evidence for West Germany

DIW Discussion Papers, No. 293

Provided in Cooperation with:

German Institute for Economic Research (DIW Berlin)

Suggested Citation: Pannenberg, Markus (2002) : Long - Term Effects of Unpaid Overtime: Evidence for West Germany, DIW Discussion Papers, No. 293, Deutsches Institut für Wirtschaftsforschung (DIW), Berlin

This Version is available at:

<https://hdl.handle.net/10419/18277>

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Discussion Papers

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Berlin, July 2002



DIW Berlin

German Institute
for Economic Research

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DIW Berlin

German Institute
for Economic Research

Königin-Luise-Str. 5
14195 Berlin,
Germany

Phone +49-30-897 89-0
Fax +49-30-897 89-200

www.diw.de

ISSN 1619-4535

Long - Term Effects of Unpaid Overtime

Evidence for West Germany

Markus Pannenberg

DIW Berlin and IZA, Bonn

Why do people work unpaid overtime? We show that remarkable long-term labor earnings gains are associated with unpaid overtime in West Germany. A descriptive analysis suggests that over a 10-year period workers with unpaid overtime experience on average at least a 10 percentage points higher increase in real labor earnings than their co-workers. Applying panel data models this result generally holds. Furthermore, we find evidence for gender specific differences with respect to the effects of cumulative average unpaid overtime work. Our results point to the importance of investment in current working hours beyond the standard work week to enhance real earnings prospects.

JEL Classification: J22, J23, J31, J33.

Keywords: Overtime, Overtime Compensation, Labor Earnings, Linear Panel Data Models.

* Address: DIW Berlin, 14191 Berlin, Germany. Tel.: +49(-30) 89789-678; fax: + 49(-30) 89789-109; e-mail:mpannenberg@diw.de. Special thanks for helpful comments and discussions go to Rob Euwals, John Haisken-DeNew, Jenny Hunt, Michael Shields, Martin Spiess and Gert Wagner.

I. Introduction

Unpaid work is a notable phenomenon in most industrialized labor markets, in particular for white collar workers. Recent studies for Germany and the UK (Bauer/Zimmermann (1999), Bell/Hart 1999, Bell/Hart/Hübler/Schwerdt 2000, Pannenberg/Wagner 2001) show that in West Germany roughly one out of three white collar workers and in Great Britain more than 50% of all managers, foremen and supervisors work unpaid overtime. Moreover, averaged across all workers the weekly amounts of worked unpaid overtime hours are at least as high as the paid for overtime hours in both countries. In addition it is pointed out that the estimated returns to education, experience and tenure in a standard Mincerian hourly wage equation framework are remarkably lower if one adjusts hourly wages for unpaid overtime hours (Bell/Hart 1999, Bell/Hart/Hübler/Schwerdt 2000).

In view of the observed amounts of unpaid overtime we have to ask whether the notion that this type of overtime is “unpaid” is really appropriate. Economic theory provides at least four different classes of explanations¹ that there is no such thing as “unpaid” overtime: (1) Employers and employees uncertainty about the required effort to conduct specific complex tasks leads to contracts that specify for example yearly income combined with a performance-related pay scheme but do not specify a binding standard working week. This might lead to persistent “unpaid” overtime beyond the non binding standard working week. (2) Overtime pay regulation at the industry level, like that observed in Germany, might lead to combinations of paid and unpaid overtime as a bargained agreement between employers and employees at the firm level to circumvent these regulations. (3) Unpaid overtime might be part of a gift exchange between an employer and an employee; e.g., employees respond to employer-financed on-the-job training with unpaid overtime. (4) If firms use promotions to sort workers within hierarchies, workers exert effort in terms of current unpaid overtime among others to be promoted to better paid positions in the future. Moreover, even without

¹ See Bell/Hart (1999) for a survey.

explicit promotion policies workers might provide unpaid overtime, since within a forward looking labor supply model, the workers current amount of (unpaid) work hours has an impact on their advance in the distribution of earnings and this effect increases with a rise in earnings inequality (Bell/Freeman 2001).

There is some empirical evidence consistent with the sketched hypotheses. As quoted above, a lot of studies provide evidence that the likelihood of unpaid overtime increases in qualification. Since on average the complexity of a job increases with the required qualification these results are in line with hypothesis (1). Evidence consistent with the compensating differential hypothesis (2) is provided by Trejo for the US (1991). Trejo shows that workers and employers adjust the hourly wage in response to a change in the overtime premium. Pannenberg (2002) provides some evidence for a positive correlation of unpaid overtime and on-the-job training for West Germany, which is in line with hypothesis (3). Moreover, Booth et al (2002) and Francesconi (2001) provide evidence for a significant correlation of overtime hours worked and subsequent promotions in Great Britain, though Booth et al. (2002) do not find varying effects for paid and unpaid overtime. Bell/Freeman (2001) provide supportive evidence for their forward looking labor supply model using data for the US and Germany.

In this paper we add to the existing empirical literature by assessing the long-term impact of unpaid overtime on labor earnings for Germany. We use panel data for West Germany over the period 1988 to 2000 to analyze cumulative average effects of unpaid overtime on labor earnings. We start with a brief description of the data and some descriptive evidence on the incidence and amount of unpaid overtime for our specific subsample (section II). We then provide descriptive evidence of the relationship between unpaid overtime and long-term labor earnings growth (section III). In section IV we use panel data models to assess whether observed cumulative average unpaid overtime has an impact on labor earnings. Section V concludes with a discussion of our results.

II. Data and basic trends

Our empirical analysis is based on the German Socio-Economic Panel (GSOEP). The GSOEP is a nationally representative longitudinal data set for Germany which was first conducted in 1984 (Wagner et al. 1993, SOEP Group 2001). We use data for the years 1988 up to 2000.² Our analysis is restricted to full-time workers living in West Germany aged 18 up to 65 in the relevant years. These workers have to remain with their firm for their specific set of observations but might experience mobility within the firm like promotions or demotions. The restriction to job stayers allows us to disentangle the long-term impact of cumulative unpaid overtime from individual and firm specific fixed effects as well as individual and firm specific time trends. Furthermore, workers in the public sector, in agricultural, fishing or private households, self-employed persons and respondents with missing information on wages, standard and actual hours worked, overtime hours and overtime compensation are dropped. Information on overtime and overtime compensation stems from questions on the amount of overtime in the last month preceding the interview and on usual types of overtime compensation. The questionnaire allows us to differentiate between paid overtime, unpaid overtime, overtime compensated with hours or days off and a partly paid/partly compensated with extra time off category. The wage measure used is the monthly gross real labor earnings in the months preceding the interview including overtime payments. Bonuses such as a 13th or 14th month salary, holiday pay, profit related pay or bonuses are drawn from the subsequent wave, divided by 12 and added to the monthly wage measure.

Table 1 displays the shares of the different types of overtime compensation for workers with overtime work in the month before the interview and their average amount of overtime hours for our subsample of job stayers. With respect to the shares of overtime compensation we do observe a share of unpaid overtime of roughly 21% of all workers with overtime incidence, which decomposes to 32 % for white collar and 3% for blue-collar workers. This is close to

² From 1988 on the required information on overtime work and working hours is provided for each year.

the figures found in studies which do not restrict themselves to job stayers.³ Moreover, table 1 reveals a dramatic decrease in paid overtime over the whole period and a remarkable increase in “extra days off later on“ like other studies do. The later mirrors the fact that in Germany both unions and employers associations are pushing so called individual “working time accounts” since the beginning of the 90’s: Overtime hours are transferred into these accounts, when workers are required to work overtime due to short run fluctuations in product demand and overtime hours have to be drawn from these accounts within a given period when short-run product demand allows for a transitory reduction of individual working hours respectively. Employers surely prefer “working time accounts” over paid overtime to cope with short-run fluctuations of labour demand, since the transactions costs of a flexible working time scheme, once it is set up, are lower than costs due to overtime premiums. Unions support these accounts in light of the idea of work-sharing, i.e. the notion of transforming paid overtime into transitory overtime and allocating the remaining definite amount of overtime hours to unemployed workers.

The average amount of overtime worked, conditional on overtime incidence, under different overtime compensation regimes over all years varies between 2.9 hours for “extra days off later on” up to 6.6 hours per week for workers with unpaid overtime. Note that in all years the average amount of overtime hours with no pay in the month before the interview is greater than or equal to the average amount of worked overtime hours within any other compensation system.

III. Descriptive Evidence

Table 2 shows the change in log real monthly labor earnings over a 10-year period by the type of overtime compensation for overtime hours worked in the relevant period.⁴ Workers with no overtime at all experience a median real earnings growth of roughly 7%, while the 25th

³ See Bauer/Zimmermann (1999) or Pannenberg/Wagner (2001).

⁴ See Table A1 in the Appendix for descriptive statistics of all variables for our subsample.

percentile of their real earnings growth distribution is negative (-7 log points) and their 75th percentile is 17 log points. If we calculate the 10-year growth in real labor earnings for workers with either paid overtime or no overtime at all, we find that their median labor earnings growth is about 10% and the 25th and 75th percentile are 5% and 22%, respectively. If we calculate the median growth in earnings for workers with “working time accounts” at least in one year and any combination of paid overtime and no overtime work in the remaining years, median growth in real earnings is remarkably higher at 14% for these group of workers as is the 25th- and 75th percentile of their earnings growth distribution. If we additionally allow for unpaid overtime in at least one year and any combination of other forms of overtime compensation or no overtime at all in the remaining years, we do find the highest median growth in real labor earnings for this group of workers (25 log points) as well as the highest 25th (11 log points) and 75th percentiles (48 log points). Hence, a naive comparison of groups of workers with different overtime incidence and different overtime compensation patterns shows varying patterns of wage growth over a 10-year period and in particular finds that the group of workers with at least some incidence of unpaid overtime over the 10-year period experiences the highest median wage growth.

To extend the descriptive exploration of our data we estimate a simultaneous quantile regression model for 10-year growth in real labor earnings with three quantiles (0.25, 0.50 and 0.75). This exercise reveals whether we do observe significant correlation between different combinations of incidence and compensation of overtime work and long-term wage growth at different parts of the long-term real earnings growth distribution while also conditioning on within firm mobility as well as a set of individual characteristics like gender, age or education. Table 3 shows the results of this exercise. First of all, we do not observe a significant correlation between the incidence of paid overtime and long-term real earnings growth over the entire earnings growth distribution. Moreover, we find a significant correlation over the 10-year period between the incidence of overtime work compensated with extra days off later

and long-term real earnings growth as well as between unpaid overtime and long-term earnings growth over the entire growth distribution. Testing for differences in estimated coefficients for each type of overtime compensation across quantiles, we cannot reject the null hypothesis of common parameters across the earnings growth distribution. Hence, we use standard linear panel data models in the following section to assess the long-term impact of unpaid overtime. Furthermore, note that we do observe a significant positive correlation between within firm mobility and long-term earnings growth over the entire earnings growth distribution.

IV. Econometric Analysis

Estimation Strategy

Our wage measure is the real monthly labor earnings including possible paid overtime earnings as well as the monthly share of performance-related pay received in the relevant year. In our empirical work we use the following framework similar to the one suggested by Hunt (1999) and apply it to the problem at hand. The straight-time hourly wage of a worker i in year t is modeled as

$$(1) \quad \ln(w_{it}^h) = \theta_1 \left(\frac{\sum_{t=1}^{s_t} otup_{it}}{\sum_{t=1}^{s_t} I_{it}} \right) + \theta_2 \left(\frac{\sum_{t=1}^{s_t} otwacc_{it}}{\sum_{t=1}^{s_t} I_{it}} \right) + X_{it}\beta + \gamma_i t + \alpha_i + \varepsilon_{it}$$

where w_{it}^h is the straight-time hourly wage, $otup_{it}$ is the average weekly amount of unpaid overtime, measured by the difference of average actual hours worked including any overtime and bargained weekly standard hours h_s and combined with the information on the type of overtime compensation, $otwacc_{it}$ is the average weekly amount of overtime compensated with extra days off later on⁵, I_{it} is an indicator variable with $I_{it} = 1$ if a valid observation is

⁵ If the respondent answers that overtime work is usually partly paid, partly compensated with extra days off later on, we use on half of the average amount of overtime worked.

available, X_{it} is a vector of additional characteristics, γ_it is an individual-specific time trend in labor earnings, which allows for heterogeneous individual growth rates, α_i is an individual fixed effect and ε_{it} is an error term.

The monthly wage w_{it}^m is defined as

$$(2) \quad w_{it}^m = w_{it}^h (4.33 * h_s + (1 + p) * OT_M^P)$$

where p is the overtime premium and OT_M^P ($0.5 * OT_M^P$) is the amount of overtime hours worked in the month where monthly labor earnings including any overtime is collected if their overtime is usually paid (*partly paid/partly compensated with extra time off*).

Combining (1) and (2), the log of the monthly labor earnings can be expressed as⁶

(3)

$$\begin{aligned} \ln(w_{it}^m) &= \theta_1 \left(\frac{\sum_{t=1}^{s_i} otup_{it}}{\sum_{t=1}^{s_i} I_{it}} \right) + \theta_2 \left(\frac{\sum_{t=1}^{s_i} otwacc_{it}}{\sum_{t=1}^{s_i} I_{it}} \right) + X_{it}\beta + \gamma_it + \alpha_i + \varepsilon_{it} + \ln \left[4.33 h_s + (1 + p) OT_M^P \right] \\ &= \theta_1 \left(\frac{\sum_{t=1}^{s_i} otup_{it}}{\sum_{t=1}^{s_i} I_{it}} \right) + \theta_2 \left(\frac{\sum_{t=1}^{s_i} otwacc_{it}}{\sum_{t=1}^{s_i} I_{it}} \right) + X_{it}\beta + \gamma_it + \alpha_i + \varepsilon_{it} + \ln(4.33) + \ln(h_s) + \ln \left(1 + \frac{(1 + p) OT_M^P}{4.33 h_s} \right) \\ &\approx \theta_1 \left(\frac{\sum_{t=1}^{s_i} otup_{it}}{\sum_{t=1}^{s_i} I_{it}} \right) + \theta_2 \left(\frac{\sum_{t=1}^{s_i} otwacc_{it}}{\sum_{t=1}^{s_i} I_{it}} \right) + X_{it}\beta + \ln(4.33) + \ln(h_s) + \frac{(1 + p) OT_M^P}{4.33 h_s} + \gamma_it + \alpha_i + \varepsilon_{it} \end{aligned}$$

The parameters of primary interest are θ_1 and θ_2 . They pick up the correlation with $\ln(w_{it}^m)$ of the cumulative average amount of unpaid overtime per week, and the cumulative average amount of overtime worked per week within a working time account scheme for the period $t=1$ to $t=z$, respectively. They are therefore indicators for cumulative effects of unpaid overtime (*working time accounts*). The reason for explicitly modeling the cumulative effect of

working time accounts are twofold: First, these accounts sometimes are not balanced within the bargained period and are thus essentially “converted” to unpaid overtime. Second, we do observe an increase in long-term working time accounts, where workers accumulate overtime deposits over very long periods and we want to pick up the earnings effects of this persistent overtime effort over a longer time period.

We estimate two versions of equation (3). The first one employs the restriction $\gamma_i = 0$ and thus amounts to estimating a standard fixed-effects model. The second version allows for fixed effects as well as an individual specific time trend in monthly real labor earnings. This specification picks up unobserved individual characteristics that influence not only the wage level, but that also have an impact on the individual specific rate of earnings growth. Note furthermore, that due to the fact that we analyze a sample of job stayers the general specification also wipe out firm specific fixed effects and implicitly controls for a firm specific real earnings trend. The estimated parameter for $\ln(h_s)$ is restricted to 1, but we do not impose a restriction on $(1+p)$ since overtime premiums might vary across workers and imposing the average German overtime premium of $p = 0.25$ slightly influences our estimates of θ_1 and θ_2 . We estimate both versions separately for male and female workers. Standard errors are robust to heteroscedasticity in the standard fixed effects estimation. The full model is estimated by first differencing equation (3), wiping out α_i , and then applying a Within estimator to the resulting equation in order to sweep out γ_i . Standard errors in this case are adjusted for heteroscedasticity and serial correlation along the lines suggested by Arellano (1987).⁷

To sketch long-term effects of overtime work that is not directly remunerated we use the full unbalanced set of observations of workers in our subsample with at least an observed 10-year

⁶ The approximation $\log(1+x) \approx x$ is applied in step 3.

growth in labor earnings. Longitudinal attrition factors, calculated from the staying probabilities supplied with the survey, are used in all estimations in order to take into account panel attrition.⁸ The X vector includes bargained weekly standard hours h_s and a variable for the number of within firm job changes. A full set of time dummies is also included in all specifications.

Results

Table 4 displays the results of our estimation exercise. Column 1 and 2 show the results for male and female workers employing the restriction $\gamma_i = 0$, i.e., using a standard fixed effects model. The estimated parameters for the cumulative average effect of unpaid overtime are in both cases significantly positive and the effect for females is slightly higher⁹ than the one for males. Hence, we do find long-term effects of unpaid overtime: A persistent increase in average unpaid overtime work of one hour per week goes along with an increase in hourly real labor earnings of 2 log points for male workers and 3 log points for female workers. Note that this result holds while controlling for the number of internal job changes in previous years. On average one internal job change is associated with an increase in hourly real earnings of 8 log points.¹⁰

The estimated parameter for the cumulative average effect of overtime worked which is compensated by extra days off later on is significantly positive for male workers and significantly higher ($\chi^2(1) = 8.2$) than the corresponding one for unpaid overtime worked. Working overtime persistently within a working time account scheme is therefore also correlated with long-term earnings for men in the restricted specification. This is consistent with at least two explanations: (1) As mentioned above deposits in working time accounts are

⁷ See also Greene (2000) for a discussion of this procedure, which is a combination of the White and the Newey-West estimator.

⁸ See Wooldridge (2002, pp. 577) for a detailed discussion.

⁹ The difference in the estimated coefficients between male and female workers with respect to unpaid overtime is not significantly different from zero in a pooled model with interaction terms for gender and overtime work.

often “converted” to unpaid overtime after the phasing out of the balancing period. Under this assumption the estimated parameters for both types of overtime work should be similar. (2) Workers with remarkable amounts of worked overtime within a working time accounts scheme might have unobserved characteristics that also have an impact on their individual earnings growth, e.g. high ability workers are the first to be chosen by employers to work overtime compensated by extra days off later on when cyclical fluctuations of product demand require additional labor input. We do not pick up such effects by a standard fixed effects approach.

For females we also do observe a significantly positive parameter of overtime worked within a working time account scheme which is similar to the one for unpaid overtime¹¹. As opposed to male workers however, we cannot reject the null hypothesis that the estimated coefficients for the two types of cumulative average overtime are identical for female workers ($\chi^2(1) = 1.3$).

Our estimates for the effect of straight-time working hours are significantly negative for male and female workers and confirm earlier results for the time period 1984 to 1994 provided by Hunt (1999): a one-hour reduction in standard working hours is associated with a rise in hourly labor earnings of roughly 2%.

It is possible that workers with high unobserved abilities not only have a higher earnings level but also have higher labor earnings growth due to, for example, employers learning about workers abilities. As outlined above, this might bias our estimated parameters. To check for potential bias from unobserved heterogeneity related to individual wage growth, we estimate equation (3) without imposing the restriction $\gamma_i = 0$. Column 3 and 4 reveal the results of this exercise.

¹⁰ If we allow for interactions of our cumulative average overtime variables and the variable “number of job changes” the regressions yield significantly positive coefficients for these interaction terms.

¹¹ Note however, that we do find significant gender differences in estimated coefficients in a pooled model with interactions of gender and overtime work with respect to working time accounts

With respect to male workers, the estimated coefficient for the cumulative average amount of unpaid overtime is significantly positive and identical to the one in the restricted specification. Hence, we do find again significant long-term labor earnings effects associated with unpaid overtime. The estimated coefficients for the cumulative average effect of overtime work compensated by extra days off later on is only weakly significantly positive ($\alpha=0.1$). Hence, controlling for heterogeneous individual earnings growth rates absorbs the former correlation between cumulative average overtime worked with extra days off later on and real labor earnings for male workers. This is for example consistent with high ability workers primarily chosen by employers when overtime work is required, as mentioned above.

Considering the cumulative effects of not straightly paid overtime for female workers, we find that neither of the estimated parameters is significantly different from zero. Hence, controlling for heterogeneous individual earnings growth rates picks up the former correlation between both types of overtime work and real labor earnings for females. Therefore, we do find significant long-term earnings differentials between male and female workers with respect to unpaid overtime. Our results fit for example into the “sticky floor” model of pay and promotion suggested by Booth et al. (2002). They argue that women are just as likely as men to be promoted and therefore receive an initial wage increase on promotion. However, due to either worse market alternatives or to less positive firm responses to outside offers for women, women receive lower wage gains consequent upon promotion. In view of our estimates this might imply that higher ability women experience higher individual earnings growth but that controlling for a given number of promotions we do not find additional returns to investments into unpaid overtime for them.

The estimated coefficients of straight-time hours are robust against the change in the empirical specification for male and female workers. Note, that taking into account heterogeneous individual earnings growth rates leads to insignificant parameter estimates for within firm mobility.

Checks of robustness

Our results rely on a subsample of job stayers with an observed (unbalanced) 10-year period of earnings growth. To check the robustness of our results, we rerun our regressions for subsamples with at least 3-year, 5-year and 7-year periods of earnings growth. Considering male workers, we find that the estimated parameters for the cumulative average amount of unpaid overtime are completely robust against changes in the selection criteria. Similarly, the estimated parameters for the cumulative average effect of overtime work compensated by extra days off later on do not change significantly (specification I). With respect to the size of the estimated parameter for the cumulative average effect of overtime work compensated by extra days off later on this also holds under specification II. However, we do observe slight changes in the significance level ($\alpha=5\%$ versus $\alpha=10\%$) in this case. Considering the results for female workers, we do not find any significant changes in either cumulative overtime parameters with respect to specification I. This is also true for the estimated parameters for the cumulative average effect of overtime work compensated by extra days off later on under specification 2. However the significance level slightly varies: Allowing for individual earnings trends leads to insignificant parameters for overtime work compensated by extra days off later on for the 3-year and the 10-year time spans while we do find a significant impact of cumulative average unpaid overtime for the other two time periods ($\alpha=5\%$).

One might argue that education matters within our context and that our empirical specification with fixed individual effects and an individual specific time trend in labor earnings does not take this into account in an appropriate way. Therefore, we allow for an interaction of tenure and education (measured by dummies for apprenticeship and university degree) in our standard fixed effects approach (specification 1) and estimate the model using first differences to eliminate the fixed effects. The results are in line with those of our preferred specification (*specification 2*). With respect to male workers we find again a significant effect of the

cumulative average amount of unpaid overtime, which is only slightly lower ($\hat{\theta}_1 = 0.01$). However, for female workers we do not find a significant correlation between unpaid overtime and labor earnings.

To check for observed individual earnings dynamics instead of allowing for an individual earnings trend, we estimate a dynamic version of equation (3) by means of including a lagged dependent variable and applying the restriction $\gamma_i = 0$. We apply both a (biased) Within estimator and the GMM estimator suggested by Arellano/Bond to our subsamples. The estimated parameters for both cumulative overtime variables are mostly in line with the estimates presented in Table 4. However, the estimated parameters for the lagged dependent variable using the Arellano/Bond estimator are very small (less than 0.1) for our sample of male workers and sometimes even negative for female workers.

V. Conclusion

This study finds substantial long-term real labor earnings effects associated with unpaid overtime for male job stayers in West Germany. Hence, we provide supportive evidence for the hypothesis that the notion of unpaid overtime might be misleading – at least in the long run. Rather, we might think of unpaid overtime as a current investment of workers which leads on average to remarkable returns on investment later on.

Moreover, taking into account that unobserved individual characteristics influence not only the level of real labor earnings but also individual real labor earnings growth, the significantly positive long-term real labor earnings effect of unpaid overtime for females disappears. This might point to the fact that high ability (and high effort) women receive higher earnings growth, but firms do respond differently to additional effort in terms of unpaid overtime for women and men owing to discrimination.

We find mixed evidence for long-term earnings effects associated with cumulative average overtime work within a so-called working time account scheme. Using standard fixed effects

specifications, we find a positive correlation between cumulative overtime with extra days off later on and real labor earnings, which is more pronounced for males. However, in our preferred empirical specification with individual heterogeneous labor earnings growth this correlation vanishes for female workers and is only weakly significant for male workers.

Overall, our results point to the importance of investment in current working hours beyond the standard work week to enhance real earnings prospects. Future research should model more explicitly the connections between unpaid overtime, promotions and wage growth. Moreover, the effects of working time accounts require a more detailed analysis on its own.¹²

¹² Pannenberg/Wagner (2001) provide some evidence on this subject.

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Table 1: Compensation of Overtime Work

Year	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Share of overtime compensation (in %)												
- paid overtime	41.4	42.5	42.3	42.4	40.4	37.8	32.7	34.0	29.3	22.1	21.3	17.1
- extra days off later on	18.7	19.9	19.4	22.1	21.1	21.5	23.8	24.3	29.1	30.8	35.9	39.7
- partly paid, partly extra days off later on	16.5	15.1	17.6	17.3	21.5	19.6	22.1	22.2	19.9	25.1	23.7	25.3
- unpaid overtime	23.4	22.5	20.7	18.2	16.9	21.1	21.3	19.4	21.7	22.7	19.9	17.9
Number of overtime hours (per week;ot=1)												
- paid overtime	4.6	5.0	4.8	4.8	4.6	4.8	4.1	5.1	5.0	4.6	5.2	5.9
- extra days off later on	3.2	3.3	2.9	3.2	3.2	3.3	3.7	3.6	3.4	3.6	3.4	3.9
- partly paid, partly extra days off later on	4.7	4.8	4.3	4.6	4.7	4.5	4.5	5.0	4.2	5.1	5.1	4.9
- unpaid overtime	6.0	5.8	5.0	6.1	5.7	5.8	5.2	5.0	5.7	5.7	6.6	6.3

Source: GSOEP 1988-2000, sample of job stayers; sample weights are used.

Table 2: 10-year Growth in Real Monthly Labor Earnings

- changes in log monthly earnings -

Type of compensation of overtime work	Median	25 th -percentile	75 th -percentile
- no overtime at all	0.07	-0.07	0.17
- only paid overtime in at least 1 year	0.10	-0.05	0.22
- working time accounts in at least 1 year	0.14	0.04	0.29
- unpaid overtime in at least 1 year	0.25	0.11	0.48

Source: GSOEP 1988-2000, sample of job stayers; sample weights are used.

Table 3: Overtime Work and 10-year Growth in Labor Earnings

	25 th quantile	50 th quantile	75 th quantile
only paid overtime in at least 1 year	-0.00 [0.02]	-0.01 [0.02]	0.01 [0.02]
working time accounts in at least 1 year	0.06 [0.02]	0.06 [0.02]	0.06 [0.02]
unpaid overtime in at least 1 year	0.07 [0.03]	0.08 [0.02]	0.09 [0.04]
within firm mobility (number)	0.04 [0.02]	0.06 [0.01]	0.07 [0.02]
standard hours h_s	-0.01 [0.01]	-0.00 [0.00]	-0.00 [0.00]
male	-0.02 [0.03]	-0.01 [0.02]	-0.02 [0.02]
age (in years)	-0.01 [0.00]	-0.01 [0.00]	-0.01 [0.00]
german	0.01 [0.02]	0.01 [0.02]	0.02 [0.02]
apprenticeship	0.05 [0.02]	0.03 [0.02]	0.03 [0.02]
university degree	0.12 [0.05]	0.05 [0.04]	0.04 [0.07]
constant	0.43 [0.21]	0.50 [0.14]	0.64 [0.17]
Pseudo R ²	0.07	0.09	0.13
Number of Observations (N)	1134		

Source: GSOEP 1988-2000, sample of job stayers.

Simultaneous quantile regression.

Bootstrapped standard errors in parantheses (1000 bootstrap replications).

Table 4: Overtime Work and Real Labor Earnings

	Specification 1		Specification 2	
	male	female	male	female
cumulative average amount of unpaid overtime	0.02 [0.004]	0.03 [0.011]	0.02 [0.006]	0.03 [0.024]
cumulative average amount of overtime with extra days off later on	0.04 [0.004]	0.02 [0.007]	0.01 [0.005]	0.01 [0.009]
current paid overtime	0.61 [0.046]	0.70 [0.121]	0.48 [0.059]	0.48 [0.116]
standard hours h_s	-0.02 [0.002]	-0.02 [0.003]	-0.03 [0.002]	-0.02 [0.003]
within firm mobility (number of job changes)	0.08 [0.012]	0.05 [0.020]	-0.01 [0.020]	0.01 [0.026]
Wald_X (d.f.)	1815.8 (16)	450.6 (16)	353.6 (15)	114.8 (15)
Number of Observations (N)	5813	1617	4798	1336
Number of Individuals	558	158	549	155

Source: GSOEP 1988-2000, sample of job stayers; longitudinal attrition factors are used.
 Panel data models based on equation (3) of main text with parameter restriction $\delta=1$ for $\ln(h_s)$.
 Specification (1): Imposing $\gamma_i=0$. Specification (2): no restriction on γ_i .
 Full sets of time dummies are included.
 Robust standard errors in parentheses.
 Wald_X: Wald – Test with H_0 : no joint significance of all unrestricted regressors.

Appendix:

Table A1: Descriptive Statistics of Used Subsample

Variable	Mean	Standard Deviation
Male	0.78	--
Log of monthly real labor earnings	8.46	0.35
Cumulative average amount of unpaid overtime (<i>per week</i>)	0.36	1.53
Cumulative average amount of overtime with extra days off later on (<i>per week</i>)	0.64	1.31
$\frac{OT_M^p}{4.33 h_s}$	0.03	0.07
Bargained weekly standard hours	38.13	1.81
Within firm mobility (<i>number of job changes</i>)	0.13	0.41
Number of Observations	7430	

Source: GSOEP 1988-2000, sample of job stayers.