Online Appendix

Do Women Expect Wage Cuts for Part-Time Work?

Annekatrin Schrenker

This Online Appendix provides additional material discussed in 'Do Women Expect Wage Cuts for Part-Time Work?' by Annekatrin Schrenker. Appendix A contains further details on the data, Appendix B contains additional information about the probabilistic analyses, Appendix C presents details about the discrete choice model and Appendix D presents additional results.

Online Appendix

Contents

Appendix A Data

A.1 Survey Instrument

Below is a description of the survey instrument used to elicit expectations of full-time workers about counterfactual earnings in part-time. Part-time workers are asked to consider the opposite scenario of switching to a full-time position of 40 hours per week.

Please imagine you were to switch to a part-time job from now on working 20 hours per week. Please only consider part-time jobs that you could carry out with your qualification.

(a) What monthly gross income do you expect to earn when working part-time at 20 hours per week?

(b) How likely do you think it is that a part-time position at 20 hours per week yields a gross income of less than X-20% per month?*

(c) How likely do you think it is that a part-time position at 20 hours per week yields a gross income of more than X+20% per month?*

**Please report your answer in percent. 0% means you consider it impossible, 100% means that you are certain. You can use the percent values in between to graduate your answer.* [Note: X is the individual-specific response to (a)]

A.2 Survey Administration

Sample design and field work of the SOEP and the SOEP Innovation Sample (SOEP-IS) are almost identical. For both surveys, participating households were initially selected through multi-stage random sampling with regional clustering. Face-to-face interviews take place once a year and last approximately 1.5-2 hours. Participants receive small gifts upon completion of each interview, as well as small cash incentives. Households either receive 5 Euros per completed personal interview and 10 Euros per household interview, or they receive a lottery ticket for the charitable TV lottery "Ein Platz an der Sonne" (A place in the sun). Administration of both surveys lies with the German Institute for Economic Research, DIW Berlin, but Kantar Public (formerly TNS Infratest) is responsible for the field work, including software programming, interviewer recruitment, interviewer training, and coordination of interviews.

Appendix B Probabilistic Analysis

B.1 Subjective Probability Distributions

In addition to providing point estimates of the expected counterfactual hourly wage in Euros, respondents in Wave 2016 of the SOEP-IS report the subjective probability for earning less than 80 percent and more than 120 percent of their numeric point estimate (see Section A.1 for the question wording). Figure A.1 illustrates the average discrete subjective CDF. I use non-parametric spline interpolation to fit individual-specific smooth subjective CDFs, following Engelberg et al. (2009). Non-parametric techniques allow for flexible approximations to individuals' subjective distributions and have been shown to outperform parametric approximations (Bellemare et al., 2012). The fitted CDFs pass through reported point estimates, as well as through the respective wage thresholds associated with 80 percent and 120 percent of individual-specific point estimates.

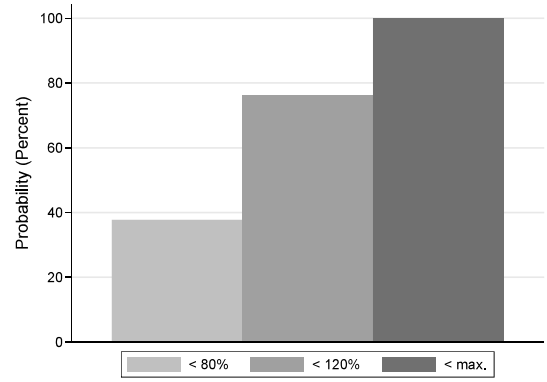


Figure A.1: Mean discrete subjective cumulative density function (CDF) for expected wages based on reported subjective probabilities. SOEP-IS (2016).

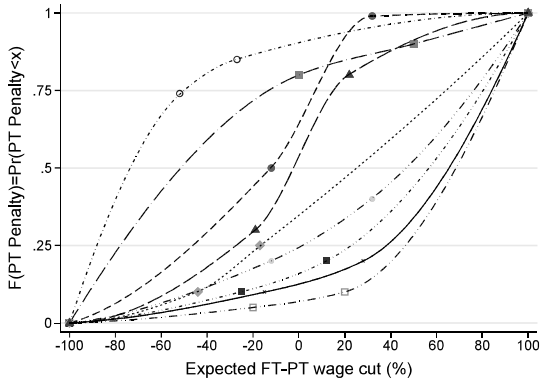


Figure A.2: Fitted smooth subjective CDFs for selected individuals, based on subjective probabilities and non-parametric piecewise cubic hermite interpolating polynomials. SOEP-IS (2016).

I use monotonicity preserving piecewise cubic Hermite interpolating polynomials based on Matlab's PCHIP, using a grid step size of one percent and setting the lower and upper bounds to -100 percent and 100 percent, respectively. Individuals who report incomplete or implausible probabilities (i.e. summing to more than 100 percent) are excluded from the probabilistic analyses. Figure A.2 illustrates the interpolation for ten randomly selected individuals. From the fitted distributions, I derive alternative measures of central tendency (subjective means and medians) and construct subjective standard deviations, interquartile ranges (P75-P25) and point prediction percentiles to measure belief uncertainty, as pioneered by Engelberg et al. (2009).

Appendix C Discrete Choice Model

C.1 Tax and Welfare Regime

The model implements details of the 2005 German tax and benefit system based on features of the German Tax and Benefit Microsimulation Model (STSM) described in Steiner et al. (2012) to simulate net income for each employment choice, following three steps: First, I subtract professional and deductible expenses to derive taxable income. Second, I calculate income tax liability by applying tax formulas depending on marital status. Finally, I deduct liabilities from gross income and add transfers to obtain net income.

To obtain taxable income in step one, gross labor income of the household is converted into real terms (base year 2005) and aggregated to annual amounts. For counterfactual choice categories, I derive alternative-specific gross earnings by multiplying hours times the hourly wage rate that is allowed to vary across full-time and part-time choices. I disregard income components from alternative sources such as capital income or income from renting and leasing.[27] Given gross annual real income, I deduct the lump-sum amount of 920 Euros for professional expenses ("Werbungskosten") for all workers. In addition, actual or lump-sum deductible expenses ("Sonderausgaben") are subtracted up to a maximum amount. I simplify this step and consider only the general flat rate amount of 36 Euros ("Pauschbetrag") as well as expenses for social security contributions.[28] Table A.1 presents detailed information on how deductible expenses are accounted for. For simplicity, the model does not incorporate loss deductions and extraordinary deductible expenses ("aussergewöhnliche Belastungen"). One further simplification I resume to involves the distinction between child allowances that are deducted before applying the tax function and child benefits ("Kindergeld"), which are added afterwards. A more accurate account of the tax-benefit system would conduct a higher-yield test ("Günstigerprüfung") and assign the more favorable rule (Steiner and Wrohlich, 2008). I abstract from this distinction and assume all couples with children receive child benefits.

[27] Since I exclude pensioners and self-employed women, I also disregard income from pensions or self-employment.

[28] I abstract from other deductible expenses such as insurance contributions, alimony payments, church tax, expenses for training, donations, and tax consultancy expenses

Table A.1: Annual Deductable Expenses for Social Security Contributions in 2005

	Single individual	Married couple
Minimum ("Vorsorgepauschale")	$0.2 \cdot RV \ + \ min(0.12 \cdot INC, 1900)$	$0.2 \cdot RV_{HH} \ + \ min(0.12 \cdot INC_{HH}, 3800)$
Actual expenses		
Bracket 1 ("Diff. Vorwegabzug")	$max(0, 3068 - 0.16 \cdot INC)$	$max(0, 6136 - 0.16 \cdot INC_{HH})$
Bracket 2	$min(1334, SV - Bracket\ 1)$	$min(2668, SV - Bracket\ 1)$
Bracket 3	$min(667, SV - Bracket\ 1 - Bracket\ 2)$	$min(1334, SV - Bracket\ 1 - Bracket\ 2)$
Maximum	2001	4002

Notes: All amounts in Euros and annual terms. RV= old age pension contributions ("Rentenversicherung"). HH= household level. INC= gross income. SV= total social security contributions ("Sozialversicherung"). Old age (RV) contributions deductable up to a correction factor (20% in 2005)

Given taxable income, I obtain income tax liability of the household in step two. In Germany, due to the joint taxation of married couples ("Ehegattensplitting"), singles and married individuals are taxed differently. For singles, income tax formulas are applied directly to individual taxable income. For married couples, total taxable income of the household is first divided by two. Income tax formulas are then applied to half the amount of total taxable household income. The derived tax liability is then doubled to determine overall tax liability of the couple. Table A.2 contains income tax formulas as well as minimal and maximal marginal tax rates for all available tax brackets. Income is not taxed below an annual allowance of 7,664 Euros and tax rates evolve according to a partially linear rule until a top income threshold of 52,152 Euros, after which income is taxed at a constant marginal rate of 42%.

Table A.2: Income Tax Formula in 2005 (§ 32 a Abs. 1 EStG)

Zone	Tax bracket	Tax formula	MTR (min)	MTR (max)
1	$\leq$ 7664	t=0	0	0
2	7665-12739	t=(883.74Y + 1500)Y	15%	23.97%
3	12740-52151	t=(228.74Z + 2397)Z + 989	23.97%	42%
4	$\geq$ 52152	t=0.42X - 7914	42%	42%

Notes: Income and tax liabilities refer to annual Euro amounts. MTR = marginal tax rate. Y and Z are 1/10000 of excess income over upper bound of the previous bracket. X is taxable income.

In step three, I compute net income by deducting income tax, social security contributions, and the solidarity surcharge ("Solidaritätszuschlag")[29] from gross income and by adding transfers and benefits. I calculate unemployment benefits according to ALG II standard rates ("Regelbedarfssätze") that differ between East and West German regions and by household composition (Table A.3). Payments are means-tested and individuals

[29]Solidarity surcharge of 5.5% on tax liability accrues for couples (individuals) owing above 1944 (972) Euros annual tax.

are only eligible for unemployment transfers if joint household income, including spousal income, is lower than transfer claims and if household assets are below exempted wealth allowances. I simplify the means-test by assuming households are ineligible for social assistance as soon as one spouse has positive labor income. In accordance with the STSM, I do not model payments from unemployment insurance (ALG I).[30] Child benefits are added once for each couple (the first three children receive 154 Euros each, all additional children receive 179 Euros each). I refrain from covering any additional benefits (e.g. allowances for housing, education, widows etc.).

Table A.3: Unemployment Benefit Standard Rates in 2005 (SGB II/Hartz IV and SGB XII)

	Single adults (I)	Adults in couples (II)	Youth 14 - 18 (III)	Children < 14 (IV)
East	331	298	265	199
West	345	311	276	207

Notes: Monthly allowances per person in Euros.

C.2 Simulated Log Likelihood Function

If full-time and part-time wages were observed for all individuals, including non-workers, the log-likelihood function would be given by

$$ln(L(\theta)) = \sum^{N} ln\left(\frac{exp(\beta' x_{ni})}{\sum_j exp(\beta' x_{nj})}\right) + \sum^{N}\left\{ln\ \phi\left(\frac{lnw_n - Z_n'\gamma}{\sigma_w}\right) - ln\ \sigma_w\right\} \qquad \text{(C.1)}$$

where the first summand denotes the likelihood contributions from logit choice probabilities over hours choices and the second term gives the likelihood of the wage equation residuals, assuming log-normality, where $\phi(.)$ is the normal density.

Accounting for unobserved wage offers, two types of prediction errors must be integrated out, resulting in the following simulated log-likelihood function:

[30] Individuals who worked in the previous year are, in principle, entitled to payments from unemployment insurance for the first 6 months after becoming unemployed. These payments are not means-tested and replace 60-67% of previous net income. I follow the STSM and assume all unemployed directly apply for unemployment benefits (ALG II).

$$
\begin{aligned}
ln(SL) = & \sum^{FT} ln \left\{ \frac{1}{R} \sum^{R} P_{n,FT}^{(r)} \right\} + \sum^{FT} \left\{ ln\ \phi \left(\frac{lnw_n^{FT} - Z_n' \gamma^{FT}}{\sigma_w^{FT}} \right) - ln\ \sigma_w^{FT} \right\} \\
& + \sum^{FT} \left\{ ln\ \frac{1}{R} \sum^{R} \phi \left(\frac{lnw_n^{PT,(r)} - Z_n' \gamma^{PT}}{\sigma_w^{PT}} \right) - ln\ \sigma_w^{PT} \right\} \\
& + \sum^{PT} ln \left\{ \frac{1}{R} \sum^{R} P_{n,PT}^{(r)} \right\} + \sum^{PT} \left\{ ln\ \phi \left(\frac{lnw_n^{PT} - Z_n' \gamma^{PT}}{\sigma_w^{PT}} \right) - ln\ \sigma_w^{PT} \right\} \\
& + \sum^{PT} \left\{ ln\ \frac{1}{R} \sum^{R} \phi \left(\frac{lnw_n^{FT,(r)} - Z_n' \gamma^{FT}}{\sigma_w^{FT}} \right) - ln\ \sigma_w^{FT} \right\} \\
& + \sum^{OLF} ln \left\{ \frac{1}{R} \sum^{R} P_{n,OLF}^{(r)} \right\} + \sum^{OLF} \left\{ ln\ \frac{1}{R} \sum^{R} \phi \left(\frac{lnw_n^{FT,(r)} - Z_n' \gamma^{FT}}{\sigma_w^{FT}} \right) - ln\ \sigma_w^{FT} \right\} \\
& + \sum^{OLF} \left\{ ln\ \frac{1}{R} \sum^{R} \phi \left(\frac{lnw_n^{PT,(r)} - Z_n' \gamma^{PT}}{\sigma_w^{PT}} \right) - ln\ \sigma_w^{PT} \right\}
\end{aligned}
\tag{C.2}
$$

where $P_{n,i}^{(r)} = \frac{exp(\beta' x_{ni})}{\sum_j exp(\beta' x_{nj}^{(r)})}$ denotes the simulated logit choice probability from draw $r \in R$. $w_n^{FT,(r)}$ and $w_n^{PT,(r)} \in x_{nj}^{(r)}$ are simulated full-time and part-time wage offers.

A full information maximum simulated likelihood estimator is given by

$$
\hat{\theta}_{FIMSL} = argmax_\theta\ ln(SL), \qquad \theta = (\beta, \gamma, \sigma_w^{FT}, \sigma_w^{PT})
$$

Appendix D Additional Results

D.1 Perceived Returns based on Working Hours including Overtime

In this section, I explore the implications of including current overtime in defining women's working hours for estimating the perceived returns (also see the discussion in Section 3.1). The asymmetry in beliefs between full-time workers and part-time workers documented in Figure 1 is amplified further when expectations take into account current overtime (Figure A.3). Full-time working women expect even smaller part-time wage penalties when overtime is taken into account (yielding small expected part-time wage premiums, -4.65 percent), whereas part-time working women expect even stronger full-time premiums (12.84 percent). This finding is not surprising, given that an inclusion of overtime hours reduces the current factual hourly wages of both full-time workers and part-time workers, while leaving untouched perceived counterfactual wage offers. Hence, perceived pay gaps between working full-time and part-time decrease for full-time workers and increase for part-time workers.

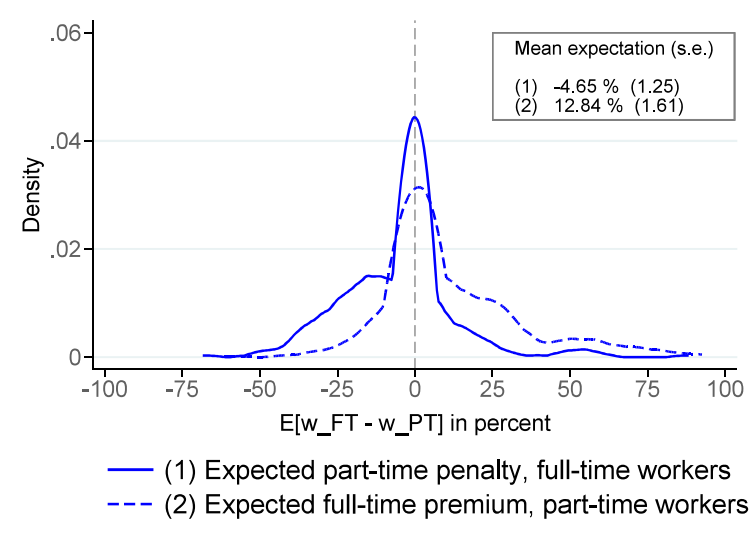


Figure A.3: The plot shows the distribution of the expected part-time wage penalty amongst full-time workers (1, solid line, N = 312) and the expected full-time wage premium amongst part-time workers (2, dashed line, N = 349). Working hours are defined as actual hours including overtime. The box shows sample means with standard errors (s.e.) in parentheses. SOEP-IS (2016-19).

D.2 Perceived Returns by Occupation and Industry

Here I show how expectations covary with current occupation and industry.

Table A.4: Estimates of the Perceived Returns by Occupation and Industry

	Full-time workers		Part-time workers	
	Mean	S.E.	Mean	S.E.
All women	0.21	(1.27)	6.70	(1.56)
International Standard Classification of Occupations (ISCO 2008)				
1. Managers	6.69	(4.85)	4.97	(6.96)
2. Professionals	3.72	(4.99)	11.20	(4.65)
3. Technicians and associate professionals	−1.09	(1.67)	5.09	(1.97)
4. Clerical support workers	−0.77	(1.76)	5.77	(4.12)
5. Service and sales workers	1.25	(3.60)	9.58	(4.52)
7. Craft and related trades workers	−16.73	(6.78)	−5.78	(21.49)
8. Plant and machine operators, assemblers	3.99	(3.04)	43.89	(28.19)
9. Elementary occupations	−3.52	(5.27)	−1.07	(2.92)
German Classification of Occupations (KldB 2010)				
1. Agriculture, Forestry, Farming, Gardening	−6.33	(3.61)	3.20	(6.50)
2. Raw Materials, Goods, Manufacturing	−2.25	(8.93)	18.76	(15.90)
3. Construction, Architecture, Technical Building	−4.03	(3.10)	−2.51	(4.11)
4. Natural Sciences, Geography, Informatics	0.03	(0.05)	2.64	(4.76)
5. Traffic, Logistics, Safety, Security	−0.26	(2.53)	−0.23	(3.63)
6. Commercial Services, Trading, Tourism etc.	0.06	(2.89)	7.52	(4.49)
7. Business Organization, Accounting, Law etc.	−1.64	(1.29)	6.53	(2.90)
8. Health Care, Social Sector, Teaching etc.	4.44	(3.14)	8.05	(2.49)
9. Philology, Literature, Humanities etc.	−5.95	(6.12)	−1.03	(2.37)

Notes: SOEP-IS 2016-19. The Table shows sample means of the expected part-time wage penalty among full-time workers, $\tilde{E}[\omega_{FT} - \omega_{PT}|FT]$, and the expected full-time premium among part-time workers, $\tilde{E}[\omega_{FT} - \omega_{PT}|PT]$ (in percent), with standard errors (S.E.) clustered at the person-level in parentheses. Results based on self-reported part-time status and contractually agreed working hours.

D.3 Perceived Returns by Experience in the Other Sector

To investigate if there are learning effects, Table A.5 shows how perceived returns covary with work experience in the other sector. I do not observe the full employment trajectories of respondents in the SOEP-IS. To proxy work experience in the other sector, I restrict the sample to workers observed in Wave 2019 of SOEP-IS sample I5 for which I have complete information on past employment status from 2016 onwards (N=70). I then distinguish part-time workers who were observed in part-time employment for the past 3 years from part-time workers who were observed to work full-time at least once since 2016. Likewise, I distinguish full-time-only workers from full-time workers with experience in part-time employment. Given these (limited) proxies of work experience, I do not find any evidence of learning effects, but more research with better measures and larger samples would be incredibly useful.

Table A.5: Estimates of the Perceived Returns by Experience in the Other Sector

	Mean	(S.E.)
A. Full-time workers		
Full-time only	−1.34	(1.34)
Ever part-time in last 3y.	−1.11	(1.11)
Δ Mean Diff.	−0.23	(1.73)
B. Part-time workers		
Part-time only	5.29	(2.56)
Ever full-time in last 3y.	5.80	(2.85)
Δ Mean Diff.	−0.51	(3.82)

Notes: SOEP-IS (I5) 2019. The Table shows sample means of the expected part-time wage penalty among full-time workers (Panel A, N=33), and the expected full-time premium among part-time workers (Panel B, N=37), separately by work experience in the other sector. Robust standard errors (S.E.) in parentheses. All values in percent.

D.4 Belief Uncertainty and Subjective Central Tendency

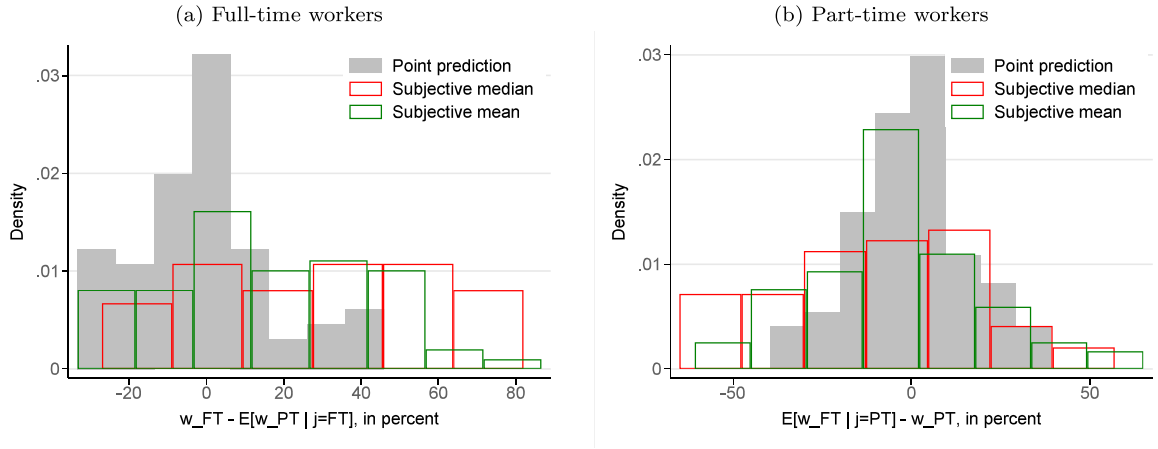


Figure A.4: The plots compare reported point predictions of the perceived returns with measures of central tendency obtained from subjective probabilities. N=66 (Panel a), N=75 (Panel b). SOEP-IS (2016).

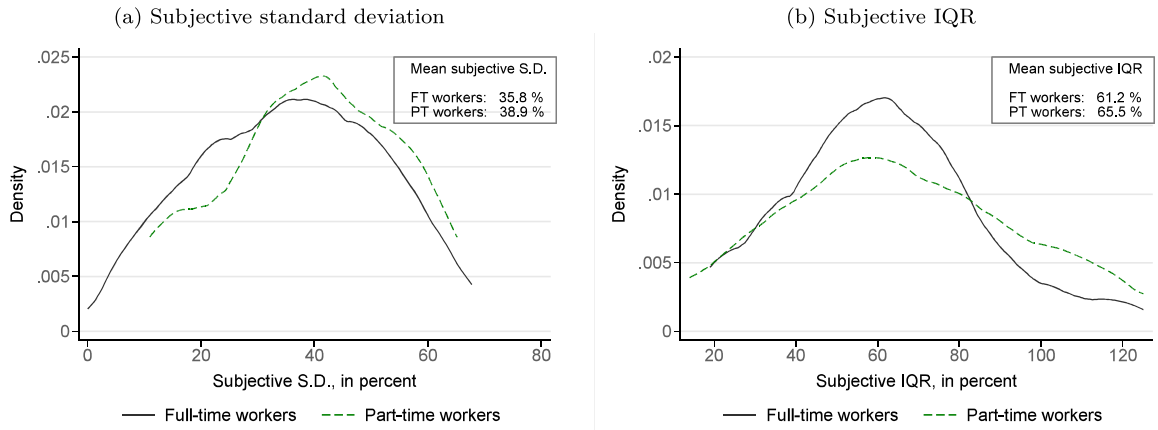


Figure A.5: The plots show kernel density estimates of the fitted subjective standard deviation (Panel a) and the subjective interquartile range, the IQR, (Panel b), based on subjective bin probabilities, separately for full-time workers (solid black line, N=66) and part-time workers (dashed green line, N=75). The IQR is given by the difference between the 75th and the 25th percentile of the fitted distribution. SOEP-IS (2016).

Table A.6: Uncertainty and Subjective Central Tendency

	Full-time workers		Part-time workers	
Subjective central tendency (CT)	Mean	Median	Mean	Median
S.D. < P25	8.2	5.5	2.4	−4.1
S.D. P25-P50	12.2	20.8	−5.3	−9.8
S.D. P50-P75	16.8	19.3	−7.7	−10.1
S.D. > P75	27.0	41.5	−7.6	−13.1
Corr (CT, S.D.)	0.52	1.46***	−0.08	−0.01
Corr (DIST, S.D.)	0.40*	0.91**	0.50***	0.80***

Notes: SOEP-IS 2016. The Table shows sample averages of the fitted subjective means and medians in percent by respondent uncertainty (measured by different percentiles of the subjective standard deviation, S.D.) for full-time workers (N=66) and part-time workers (N=75). Correlations of subjective central tendency (CT) and standard deviations, as well as of the absolute distance between reported point estimates and subjective central tendency (DIST), are adjusted for worker education, children, age, marital status, region, immigrant background, overtime hours, managerial responsibility, sector (public/private), firm size, tenure and contract type (permanent/fixed-term). Estimation with robust standard errors, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table A.7: Correlates of Belief Uncertainty

	Full-time workers		Part-time workers	
Dep.Var. = Subjective S.D.	Coef.	Std.Err.	Coef.	Std.Err.
Education: Basic	10.13	(1.56)	1.04	(0.17)
Education: Tertiary	−13.11*	(−1.94)	−4.38	(−0.63)
With children	−14.79**	(−2.66)	−2.86	(−0.54)
Age > 40y.	−8.71*	(−1.98)	2.14	(0.41)
Married	6.04	(1.06)	−7.22	(−0.78)
Eastern Germany	17.87***	(3.56)	1.37	(0.28)
Native born	−10.70	(−1.33)	4.03	(0.92)
Overtime hrs. > 0	9.78**	(2.09)	−2.00	(−0.45)
Manager	18.84***	(3.25)	13.28	(1.21)
Public sector	9.34*	(1.71)	−9.12**	(−2.28)
Firm size > 200	−6.34	(−1.58)	−2.59	(−0.61)
Fixed term contract	−3.86	(−0.83)	−0.72	(−0.10)
Tenure > 10y.	2.99	(0.64)	−2.47	(−0.60)

Notes: SOEP-IS 2016. The Table shows OLS estimates of belief uncertainty, measured by the fitted subjective standard deviation obtained from bin probabilities, on worker and job characteristics. N=51 (full-time workers), N=68 (part-time workers). Estimation with a constant and robust standard errors (Std.Err.) in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

D.5 Reduced-form Estimation of the Observed Returns

In this Appendix, I present alternative ('reduced-form') estimates of the part-time wage penalties and premiums. Section D.5.1 presents results from OLS and fixed effects estimation of sector-specific log wage functions. Section D.5.2 shows wage changes for women who actually switched between full- and part-time employment and discusses the identification challenges associated with this approach.

D.5.1. Reduced-form Wage Estimation of Sector-specific Wage Functions

I estimate sector-specific log wage equations for full-time and part-time work to impute counterfactual full-time wages for all part-time workers and vice versa, holding fixed individual-specific characteristics (endowments). A part-time wage penalty or premium can unfold if parameters vary across sectors such that the returns to identical characteristics differ between part-time and full-time work; for instance, if the returns to work experience or to having a permanent contract differ across employment states.

Formally, sector-specific log wage equations for full-time and part-time work are given by

$$ln(w_{jn}) = \alpha_j + Z_n'\gamma_j + \mu_{jn} + \epsilon_{jn} \tag{D.1}$$

where parameters and disturbances may vary over $j_n \in \{FT, PT\}$. The vector Z_n collects basic controls for years of education, a quadratic in part-time and full-time work experience (in years), as well as binary indicators for region (East/West) and immigrant background; if specified broadly Z_n additionally contains occupation major group (1-digit ISCO-88), industry (2-digit NACE), linear and quadratic tenure, as well as binary indicators for firm size (> 200), public sector, and fixed term contract. An individual-specific fixed effect that may vary over j is given by μ_{jn}.

Table A.8 presents the reduced-form estimates of Equation (D.1). Point estimates vary widely across different specifications, but largely confirm previous findings by Hirsch (2005) who documents stronger wage effects for full-time workers switching to part-time relative to the wage effects for part-time workers switching to full-time.

Table A.8: Reduced Form Estimates of the Observed Returns

	(1)		(2)		(3)		(4)	
	Coef.	Std.Err.	Coef.	Std.Err.	Coef.	Std.Err.	Coef.	Std.Err.
1. OLS, basic controls								
PT Penalty FT Workers	8.56	(0.21)***	9.16	(0.20)***	5.26	(0.16)***	4.15	(0.14)***
FT Premium PT Workers	−0.21	(0.13)	0.45	(0.13)***	−0.72	(0.12)***	−0.99	(0.13)***
2. OLS, broad controls								
PT Penalty FT Workers	3.16	(0.16)***	3.89	(0.15)***	−0.49	(0.16)**	−1.96	(0.12)***
FT Premium PT Workers	−2.20	(0.14)***	−1.14	(0.12)***	−4.52	(0.15)***	−4.72	(0.14)***
3. Fixed effects, basic controls								
PT Penalty FT Workers	11.39	(0.31)***	12.57	(0.32)***	7.35	(0.24)***	7.46	(0.21)***
FT Premium PT Workers	5.23	(0.27)***	5.80	(0.24)***	2.06	(0.23)***	2.99	(0.23)***
4. Fixed effects, broad controls								
PT Penalty FT Workers	8.71	(0.31)***	10.10	(0.31)***	6.95	(0.26)***	6.57	(0.24)***
FT Premium PT Workers	3.18	(0.29)***	4.03	(0.26)***	1.17	(0.25)***	1.31	(0.25)***
Part-time status	self-reported		self-reported		hours < 30		hours < 30	
Working hours	agreed hrs.		incl. overtime		agreed hrs.		incl. overtime	

Notes: The Table shows reduced form predictions of the part-time wage penalty for full-time workers and of the full-time wage premium for part-time workers, obtained after separate full- and part-time log wage regressions. All wage regressions are based on SOEP waves 2005-2016, with a minimum sample size of N=48,603. Predictions are presented for working women in full-time or in part-time employment sampled in GSOEP-Core 2016. Basic controls include years of education, linear and quadratic work experience in part-time and full-time, region (Eastern/ Western GER) and immigrant background. Broad controls add occupation major group (ISCO 88, 1 digit), industry (NACE,2 digit), linear and quadratic tenure and indicators for firm size > 200, public sector and fixed term contract. Robust standard errors in parentheses, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

D.5.2. Identification based on Switchers

This section presents estimates of the average wage changes among women who actually switched from full-time to part-time employment ('full-time leavers') or from part- to full-time employment ('part-time leavers').

Formally, for $j \in \{FT, PT\}$, Mincerian log wage functions are given by

$$ln(w_{n,t}) = \alpha + \beta \cdot \mathbb{1}(j_{n,t} = j | j_{n,t-\eta} \neq j) + Z'_{n,t}\gamma + \mu_n + \epsilon_{n,t} \tag{D.2}$$

where for $j = PT$, $\mathbb{1}(j_{n,t} = PT | j_{n,t-\eta} = FT)$ indicates whether individual n switched from full- to part-time employment between time t and $t - \eta$ and for $j = FT$, $\mathbb{1}(j_{n,t} = FT | j_{n,t-\eta} = PT)$ indicates a respective transition from part- to full-time employment. The parameter of interest is given by β, measured conditional on the same vector of exogenous covariates described in Equation (D.1), $Z_{n,t}$, and an individual-specific fixed effect, μ_n. Table A.9 presents estimates of Equation (D.2) based on direct year-to-year transitions, $\eta = 1$, or from all transitions within the observation period 2005-2016, $\eta \in (1, 11)$.

Table A.9: Estimates of the Observed Returns based on Switchers

	(1)		(2)		(3)		(4)	
	Coef.	Std.Err.	Coef.	Std.Err.	Coef.	Std.Err.	Coef.	Std.Err.
1. OLS, direct transition								
PT Penalty FT Leavers	−1.87	(1.11)	0.07	(1.13)	−4.93	(1.30)***	−7.38	(1.09)***
FT Premium PT Leavers	−2.66	(0.90)**	−1.95	(0.92)*	−10.94	(0.96)***	−12.10	(0.91)***
2. Fixed effects, direct transition								
PT Penalty FT Leavers	−3.48	(1.10)**	−1.57	(1.14)	−11.92	(1.28)***	−12.20	(1.07)***
FT Premium PT Leavers	−3.47	(0.93)***	−1.37	(0.97)	−11.19	(1.09)***	−12.03	(0.99)***
3. OLS, any transition								
PT Penalty FT Leavers	3.43	(0.92)***	4.32	(0.93)***	0.42	(0.96)	−0.06	(1.03)
FT Premium PT Leavers	−1.63	(1.65)	−0.49	(1.66)	−6.57	(1.64)***	−7.16	(1.66)***
4. Fixed effects, any transition								
PT Penalty FT Leavers	−2.93	(1.26)*	−1.19	(1.30)	−8.88	(1.49)***	−0.06	(1.81)***
FT Premium PT Leavers	0.61	(3.20)	6.14	(3.20)	−5.41	(3.21)	−7.95	(2.47)**
Part-time status	self-reported		self-reported		hours < 30		hours < 30	
Working hours	agreed hrs.		incl. overtime		agreed hrs.		incl. overtime	

Notes: The Table shows reduced form estimates of the part-time wage penalty for full-time working women who switched to part-time (FT Leavers) and of the full-time wage premium for part-time working women who switched to full-time (PT Leavers) in percent, in comparison to stayers. Coefficient estimates are either based on women with direct year-to-year transitions between full- and part-time sectors (Models 1-2), or on women with at least one transition in the observation period (Models 3-4). Controls include years of education, linear and quadratic work experience in part-time and full-time, region (Eastern/ Western GER), immigrant background, occupation major group (ISCO 88, 1 digit), industry (NACE,2 digit), linear and quadratic tenure and indicators for firm size > 200, public sector and fixed term contract. All wage regressions are based on GSOEP-Core waves 2005-2016, OLS estimates contain additional survey year controls. Robust standard errors in parentheses, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Estimates of the observed returns to full- and part-time work based on women switching employment status differ notably from reduced-form and structural discrete choice estimates. Estimates based on within-variation generally yield no wage penalty for full-time workers switching to part-time; if anything, these estimates suggest small wage gains in part-time. Estimates for part-time leaving women further suggest wage losses in full-time.

To the extent that the subset of switchers differs from the population of interest, results based on switchers diverge from average treatment effects.

Table A.10: Composition of Switchers and Stayers

	FT Leaver	FT Stayer	Δ FT Leaver vs. Stayer (*p-val*)	PT Leaver	PT Stayer	Δ PT Leaver vs. Stayer (*p-val*)
Gross hourly wage (in Euros)	14.97	15.91	0.02	13.97	14.47	0.09
Agreed weekly hrs.	28.31	38.67	0.00	34.77	24.00	0.00
Overtime hrs. per week	3.15	3.27	0.66	2.86	2.20	0.00
Education (in years)	12.45	12.69	0.07	12.46	12.12	0.00
Age (in years)	44.85	42.78	0.00	43.53	47.06	0.00
With children (in percent)	0.29	0.14	0.00	0.35	0.45	0.00
Eastern Germany (in percent)	0.25	0.22	0.25	0.24	0.17	0.00
Native born (in percent)	0.77	0.83	0.02	0.77	0.81	0.11
Public sector (in percent)	0.34	0.29	0.04	0.31	0.33	0.45
Firm size > 200 (in percent)	0.48	0.53	0.08	0.47	0.45	0.36
Fixed term contract (in percent)	0.13	0.06	0.00	0.17	0.08	0.00
Tenure (in years)	11.04	12.11	0.07	9.73	12.21	0.00
Manager (in percent)	0.01	0.02	0.05	0.02	0.01	0.10
N	1,164	16,298		1,432	14,902	

Notes: Sample averages with population weights. Switchers defined based on direct year-to-year transitions between full- and part-time sectors. GSOEP-Core (2005-2016).

Table A.10 presents summary statistics for the subset of women who switched between full- and part-time ('Leavers'), comparing them to women who maintained their employment status ('Stayers'). Full-time leavers significantly differ from full-time stayers in a number of observable characteristics. Likewise, part-time leavers differ notably from part-time stayers. If leavers constitute a selected group, estimates of observed penalties and premiums from actual transitions are not transferable to the sample of stayers. Given that I elicit expectations about the part-time penalty (full-time premium) among a representative sample of full-time (part-time) working women, observed returns must be computed for the population of interest comprising both switchers and stayers. Therefore, I use the wage imputation technique in the main specification, further modeling the choice to work full- or part-time within a discrete choice framework.

D.6 FIMSL Estimation Results

Table A.11 presents the full set of estimation results of the discrete choice model for different specifications of part-time status and working hours.

Table A.11: FIMSL Estimation Results of the Discrete Choice Model

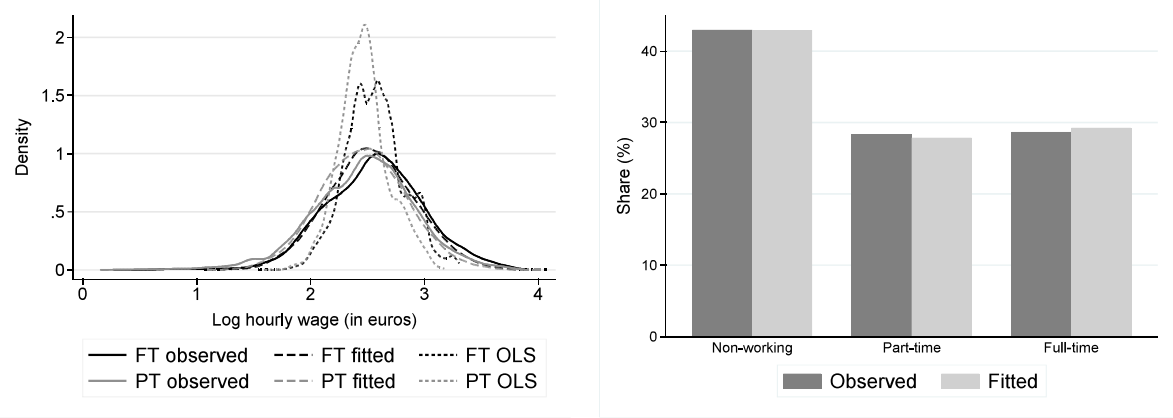
PT status: self-reported	**(1) Agreed hours**				**(2) Incl. overtime**			
	Full-time		Part-time		Full-time		Part-time	
Log wages	Coef.	Std.Err.	Coef.	Std.Err.	Coef.	Std.Err.	Coef.	Std.Err.
Education (years)	0.091	0.001	0.090	0.001	0.091	0.001	0.087	0.001
FT experience (years)	0.030	0.001	0.028	0.001	0.034	0.001	0.030	0.001
FT experience sq.	0.000	0.000	−0.001	0.000	−0.001	0.000	−0.001	0.000
PT experience (years)	0.000	0.001	0.018	0.001	−0.003	0.001	0.016	0.001
PT experience sq.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
East	−0.282	0.003	−0.261	0.004	−0.287	0.004	−0.267	0.004
Foreign born	−0.061	0.004	−0.050	0.004	−0.066	0.004	−0.052	0.004
Constant	1.140	0.009	1.060	0.010	0.994	0.011	1.018	0.012
Std.Dev.	0.076	0.001	0.090	0.001	0.087	0.001	0.102	0.001
Hours choice		Coef.	Std.Err.			Coef.	Std.Err.	
Consumption		0.124	0.003			0.138	0.003	
Hours		0.038	0.001			0.036	0.001	
Hours × Kids		0.041	0.001			0.039	0.001	
Hours × East		−0.018	0.001			−0.017	0.001	
Log likelihood		167219.180				186678.8172		
PT status: hours-based	**(3) Agreed hours**				**(4) Incl. overtime**			
	Full-time		Part-time		Full-time		Part-time	
Log wages	Coef.	Std.Err.	Coef.	Std.Err.	Coef.	Std.Err.	Coef.	Std.Err.
Education (years)	0.090	0.001	0.091	0.001	0.092	0.001	0.086	0.001
FT experience (years)	0.030	0.001	0.027	0.001	0.034	0.001	0.028	0.001
FT experience sq.	0.000	0.000	−0.001	0.000	−0.001	0.000	−0.001	0.000
PT experience (years)	0.001	0.001	0.017	0.001	0.000	0.001	0.017	0.001
PT experience sq.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
East	−0.280	0.003	−0.261	0.004	−0.279	0.004	−0.277	0.005
Foreign born	−0.064	0.004	−0.048	0.004	−0.068	0.004	−0.051	0.004
Constant	1.145	0.009	1.060	0.010	0.976	0.010	1.028	0.011
Std.Dev.	0.077	0.001	0.090	0.001	0.093	0.001	0.098	0.001
Hours choice		Coef.	Std.Err.			Coef.	Std.Err.	
Consumption		0.120	0.003			0.149	0.003	
Hours		0.037	0.001			0.035	0.001	
Hours × Kids		0.043	0.001			0.041	0.001	
Hours × East		−0.019	0.001			−0.021	0.001	
Log likelihood		167485.728				186786.764		

Notes: SOEP (2005-2016). Results from full information maximum simulated likelihood (FIMSL) estimation with constant relative risk aversion (CRRA) utility index.

D.7 Internal Goodness of Fit

I present graphical evidence of model fit (Figure A.6) and estimated wage elasticities (Table A.12) for the main specification of the discrete choice model with self-reported part-time status and agreed working hours.

D.7.1. Model Fit: Wages and Hours Choices



(a) Hourly Wages

(b) Hours Choices

Figure A.6: Goodness of Fit of the Discrete Choice Model

D.7.2. Wage Elasticities

Estimated elasticities for a one percent increase in gross hourly wage for females in the sample are 0.41 percent for working hours and 0.22 percentage points for participation. These elasticities are mostly within the confidence intervals of comparable estimates by Haan (2006), deviations can be explained by differences in sample composition, most notably I include singles whereas Haan (2006) focuses on married couples.

Table A.12: Labor Supply Elasticities

	Δ Hours (percent)		Δ Participation (p.p.)	
	Coef.	Std.Err.	Coef.	Std.Err.
All women	0.41	0.00	0.22	0.02
By region				
East	0.34	0.00	0.25	0.04
West	0.43	0.00	0.21	0.02

Notes: Predicted changes for a 1% increase in gross hourly wage.

D.8 Subgroup Comparison of the Perceived and Observed Returns

Table A.13 presents the point estimates corresponding to the graphical evidence in Figure 6 in Section 5.4.

Table A.13: Comparison of expected and estimated wage penalties and premiums by subgroups

	Full-time workers				Part-time workers			
	Expected		Estimated		Expected		Estimated	
	Mean	S.E.	Mean	S.E.	Mean	S.E.	Mean	S.E.
All women	0.21	1.27	10.23	0.92	6.70	1.56	−0.10	0.85
Education: Basic	6.85	5.79	10.03	2.18	11.44	5.62	1.60	1.84
Education: Intermediate	−1.54	1.24	9.92	1.21	4.53	1.62	−0.57	1.12
Education: Tertiary	1.46	2.97	10.94	1.84	10.64	3.94	−0.59	1.82
With children	7.10	4.48	5.24	1.54	6.81	1.81	0.41	1.07
Without children	−1.29	1.20	12.50	1.13	6.60	2.38	−0.97	1.39
Age $<$ 40 y.	1.59	2.46	8.77	1.42	6.40	2.45	3.17	1.52
Age $>$ 40 y.	−0.65	1.35	11.15	1.20	6.87	2.01	−1.60	1.02
Eastern Germany	−3.48	1.91	12.76	1.81	7.91	3.66	−1.66	2.06
Western Germany	1.36	1.54	9.26	1.06	6.47	1.72	0.23	0.93
Firm size $>$ 200	1.07	1.81	11.85	1.27	3.77	1.80	0.24	1.25
Firm size $<$ 200	−1.00	1.63	8.52	1.33	10.84	2.50	−0.38	1.16
Fixed term contract	5.46	6.47	10.66	2.59	13.04	5.95	3.75	2.32
Permanent contract	−0.47	1.15	10.43	0.98	5.87	1.60	−0.70	0.91
Manager	13.98	8.12	15.95	3.94	10.48	3.82	2.68	7.37
No Manager	−0.94	1.05	9.88	0.94	6.62	1.58	−0.13	0.85
Tenure $>$ 10 y.	0.05	1.67	15.76	1.52	3.90	2.08	−2.25	1.42
Tenure $<$ 10 y.	0.91	1.92	6.79	1.14	6.99	2.08	1.13	1.06

Notes: SOEP-IS (2016-19) and SOEP (2016). Sample means with standard errors (S.E.) of the expected and estimated part-time wage penalty (full-time workers) and full-time premium (part-time workers) overall and within subgroups. Results based on self-reported part-time status and contractually agreed working hours including overtime. Estimates from the CRRA discrete choice model. Standard errors in SOEP-IS clustered at the person-level.

D.9 Nonwage Benefits

Table A.14 shows OLS and fixed effects estimates of changes in nonwage benefits among women switching from full-time to part-time work (full-time leavers) and for women switching from part- to full-time work (part-time leavers).

Table A.14: Changes in Nonwage Benefits among Switchers

	Full-Time Leavers (vs. FT Stayers)		Part-Time Leavers (vs. PT stayers)	
	OLS	FE	OLS	FE
Christmas bonus (EUR/hr)	−0.02	−0.01	0.01	0.02
13th monthly salary (EUR/hr)	−0.06	−0.04	0.13***	0.13**
Vacation bonus (EUR/hr)	0.01	−0.03	0.00	0.01
Profit sharing (EUR/hr)	−0.16	0.12	−1.18	0.13
Public transport/ commuting grant (EUR/hr)	0.03	0.01	−0.01	0.04
Other bonus (EUR/hr)	−0.04	−0.07	−0.02	0.23
Working from home (WFH)	−0.00	−0.03	0.01	0.01
Benefit: Any	−0.06***	0.02	0.05***	0.03
Meals	−0.04**	0.02	0.04**	0.03
Company car	−0.02***	−0.00	0.02**	0.01
Phone	−0.02**	−0.00	0.01	0.01
Charges/ expenses	0.00	0.00	0.02**	0.02*
Computer/ IT	−0.02**	0.01	0.01	0.01
Other benefit	−0.01	0.00	0.01	0.00
Allowances: Any	−0.03	−0.01	0.01	−0.03
Shift/ weekend	−0.01	−0.02	−0.00	−0.04*
Overtime	−0.01	0.01	0.01	0.01
Personal	−0.02**	−0.02*	0.01	−0.00
Gratuity/ Tips	0.00	0.00	−0.00	−0.00
Other allowance	−0.02	−0.00	0.01	−0.02
Christmas bonus	−0.04**	−0.03	−0.02	0.00
13th monthly salary	−0.03*	−0.01	0.01	−0.00
Vacation bonus	−0.03*	0.01	−0.02*	−0.01
Profit sharing	−0.02*	−0.01	−0.01	0.02

Notes: GSOEP-Core 2005-2016. The Table shows coefficient estimates of changes in nonwage benefits for full-time working women who switched to part-time (full-time leavers) and for part-time working women who switched to full-time (part-time leavers), in comparison to stayers. Estimates obtained from multivariate OLS and fixed effects (FE) regression. adjusted for years of education. linear and quadratic work experience in part-time and full-time, region (Eastern/ Western GER), immigrant background, occupation major group (ISCO 88, 1 digit), industry (NACE,2 digit), linear and quadratic tenure and indicators for firm size > 200. public sector and fixed term contract. OLS models additionally contain survey year fixed effects. Estimates are based on women with direct year-to-year transitions between full- and part-time employment. Estimation with robust standard errors (FE) or with standard errors clustered at the person level (OLS), * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

In Table A.15, I document how estimated returns to full- and part-time work obtained from the discrete choice model covary with current nonwage benefits. Conditional on worker and job characteristics, full-time workers who currently receive nonwage benefits are predicted to lose less from switching to part-time than comparable workers without benefits. Among part-time workers, those receiving nonwage benefits are predicted to

gain over proportionally from switching to full-time. This correlational evidence seems to suggest that workers who receive nonwage benefits tend to work in better jobs and, on top, seem to be positively selected, but correlations are statistically insignificant, so I do not want to overinterpret these results.

Table A.15: Observed Returns and Nonwage Benefits

Dep. Var. =	Full-time workers		Part-time workers	
Predicted FT-PT wage gap in percent	BV	MV	BV	MV
Benefit: Any	−2.75	−2.20	3.31	3.10
Meals	−2.40	−2.85	4.17	3.59
Company car	−0.25	−1.69	5.33	3.81
Phone	−3.03	−3.44	13.01	9.35
Charges/ expenses	−11.60	−9.50	16.95	12.72
Computer/ IT	1.94	2.14	14.54	12.18
Other benefit	−10.43**	−8.93*	4.08	4.05
Allowances: Any	2.15	2.10	2.25	0.84
Shift/ weekend	2.73	2.68	0.10	−2.59
Overtime	6.37	6.48	7.17	3.29
Hardship	11.06	10.25	4.05	−0.89
Personal	5.66	5.59	7.89	5.09
Gratuity/ Tips	5.09	8.49	9.95	10.90
Other allowance	−0.66	−1.00	5.30	5.85
Christmas bonus	2.75	1.28	1.40	3.12
13th monthly salary	1.90	−0.51	−1.66	−0.23
Vacation bonus	2.82	0.77	0.55	2.18
Profit sharing	0.86	−0.12	−0.48	0.61
Public transport/ commuting grant	0.09	0.39	4.37	4.66
Other bonus	4.99	2.07	−5.51	−5.24

Notes: GSOEP-Core 2016. The Table shows coefficient estimates of the structurally estimated part-time wage penalty on various measures of current nonwage benefits. Estimates obtained from bivariate (BV) and multivariate (MV) OLS regressions. Multivariate estimates adjusted for years of education, linear and quadratic work experience in part-time and full-time, region (Eastern/ Western GER), immigrant background, occupation major group (ISCO 88, 1 digit), industry (NACE,2 digit), linear and quadratic tenure and indicators for firm size > 200, public sector and fixed term contract. Estimation with robust standard errors, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.