Biased Wage Expectations and Female Labor Supply

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Outline

Section 1

Motivation

Motivation

- Importance of beliefs and expectations for dynamic decisions: biased beliefs can lead to erroneous choices with unexpected adverse consequences

- In this paper: Expectations about wages and returns to experience conditional on part-time vs. full-time employment

- Choice to work part-time and part-time work as a barrier for women's potential in the labor market

  ▶ German labor market: 37% part-time employment among females (GSOEP 2017)
  ▶ Part-time penalty: stagnating wage growth over the life-cycle for part-time employees
  ▶ In the short-run, a phenomenon of selection (Manning and Petrongolo, 2008, Blau and Kahn, 2017)
  ▶ Part-time employment does not increase human capital; in the long-run wage profiles of full-time and part-time individuals diverge (Blundell et. al, 2016)

Graphs

Research questions

1. Do women have rational expectations about returns to experience in part-time and full-time employment and about the part-time penalty?

2. How do expectations about the part-time penalty affect employment choices and earnings over the life-cycle?

3. How can policy address adverse effects of biased expectations and increase female full-time employment and lifetime earnings?

Summary of analysis and findings

- We design counterfactual survey questions in the German Socio-Economic Panel Innovation Sample Survey to elicit expected wage trajectories in full-time (>32h/week) and part-time (>5h and <32h/week) employment

  - Derive expected returns to experience in part-time and full-time work: they do not differ; there is no expected part-time penalty in experience

- We contrast expected returns to experience with realised returns to experience to test for biased expectations; we control for endogeneity and selection using control functions

  - Realised and expected returns to full-time experience are well in line
  - Evidence for sizable part-time penalty in contrast to reported expectations

- We develop a structural life-cycle model of female employment allowing for biased expectations regarding human capital accumulation in part-time

  - Quantify the implications of biased expectations for employment outcomes and lifetime earnings
  - Evaluate policy reforms that address adverse effects of biased expectations

Literature

- Importance of beliefs for decisions and biased beliefs: Manski (2004), Zafar and Kuchler, Delavande and Zafar (2019) and Wiswall and Zafar (forthcoming)

- Structural models of female employment with human capital accumulation in part time and full time employment: Blundell et al. (2016) and Adda et al. (2017) - period experience accumulation in part-time only around 15% of full-time value

- Structural models that relax assumption about rational expectations and time consistent behavior: Fang and Silverman (2009) and Chan (2017), Schneider (2017)

- Female employment and wage formation and gender gaps on the labor market: e.g. Manning and Petrongolo (2008), Goldin (2014) Blau and Kahn (2017)

Section 2

Data

Data - German Socio-Economic Panel (GSOEP)

Two longitudinal annual surveys with a common set of socio-demographic variables, representative of German households

SOEP-Core $\rightarrow$ estimate part-time penalty free of endogeneity/selection

- occup. biographies, employment, earnings, health, satisfaction etc.
- waves 1992-2017, N=125,511 women-year observations, $\bar{n} = 5,000$ obs. per year
- exploit panel dimension to estimate dynamic structural model

SOEP-IS $\rightarrow$ identify beliefs about experience accumulation process

- selected SOEP-Core questions & additional innovative content Ex.
- innovative module 'Earnings', waves 2016-2017, N=603 women-year obs., $\bar{n} = 200$ obs. per year
- perceived/expected wage growth in full- and (!) part-time over next 10y

Descriptives and balancing

Sample: Females only, excl. civil servants, self-employed, in training, military/community service or marginal employment.

Section 3

Expected Returns to Experience

Beliefs elicitation SOEP-IS

- Elicit expected wage trajectories in full-time (>32h/week) and part-time (>5h and <32h/week) employment

- Individuals first report their expected monthly earnings in their current employment state - part-time or full-time employment, respectively - in one, two, and 10 years

- Second, they provide the same information for the counterfactual scenario: part-time employed individuals report expectations about the development of earnings in full-time employment, and full-time individuals in part-time employment

- 8 data points for each survey participant

- We use this data to quantify the implied expected returns to part-time and full-time experience

SOEP-IS Survey questions

Example: Question 1 to a woman that is currently employed full-time

<u>Current working hours:</u>

Suppose you continue to work full-time in the coming years, regardless of whether you are actually planning a work reduction or anything similar. Please think about full-time jobs that you can perform with your qualification. If, in reality, you are planning to reduce your workload, please still assume for the moment that you continue to work full-time in the next years.

What do you think is your gross monthly income ...

- in one year?
- in 2 years?
- in 10 years?

Probabilistic add-on (I)

SOEP-IS Survey questions (cont'd)

Example: Question 2, counterfactual question to a woman that is currently employed full-time

Hypothetical working hours:

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 current level of qualification.

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

Now suppose that you continue to work part-time in the coming years, working 20 hours per week.

What do you think is your gross monthly income ...

- in one year?

- in 2 years?

- in 10 years?

Probabilistic add-on (III)

Table: Expected Wage Growth in Part-Time and Full-Time (in %)

	1 year			2 year			10 year		
	Full-time	Part-time	p-val	Full-time	Part-time	p-val	Full-time	Part-time	p-val
All Females	3.32	4.39	(0.37)	6.82	9.71	(0.07)	20.68	25.27	(0.09)
Employment									
Full-Time	5.06	4.68	(0.85)	9.41	10.12	(0.78)	26.34	25.69	(0.88)
Part-Time	1.73	4.13	(0.08)	4.47	9.33	(0.01)	15.54	24.88	(0.01)
Education									
Low	4.53	2.97	(0.71)	7.80	7.93	(0.98)	19.37	20.94	(0.80)
Medium	2.64	3.65	(0.40)	6.06	8.33	(0.16)	19.06	24.36	(0.08)
High	5.15	7.74	(0.48)	9.06	15.50	(0.20)	27.14	30.64	(0.64)
Age									
< 35 years	6.57	4.73	(0.36)	12.24	14.90	(0.44)	29.29	36.51	(0.26)
35-45 years	1.97	7.49	(0.07)	5.27	11.99	(0.07)	18.21	26.83	(0.11)
> 45 years	2.03	2.27	(0.86)	4.25	4.93	(0.64)	16.60	17.00	(0.88)
Region									
East	2.00	3.47	(0.51)	5.49	6.66	(0.68)	17.32	18.64	(0.76)
West	3.58	4.57	(0.46)	7.08	10.30	(0.08)	21.34	26.56	(0.09)

Notes: SOEP-IS (2016-2017). Balanced panel (N=233 observations). We report expected growth in hourly wages (in %), calculated in relation to observed hourly wage in the base period. We use the reported working hours to calculate hourly wages in the observed employment state. The p-values (p-val) refer to the significance of the mean difference between full-time and part-time.

Identification of the expected returns to experience

$$log(\omega_{exp,it}) = \alpha + \eta PT_{it} + \zeta E_{it}^{Full} + \beta E_{it}^{Part} + X_i\gamma \tag{1}$$
$$+ \mu_i + \epsilon_{itp}$$

- $\omega_{exp,it}$ expected hourly wage
- $i = 1...N$ person identifier
- PT_{it} part-time scenario dummy
- $E_{it}^{Part} = \{0, 1, 2, 10\}$ part-time experience in years
- $E_{it}^{Full}\{0, 1, 2, 10\}$ full-time experience in years
- $t = 1...T$ survey year,
- μ_i individual fixed effects
- $X^{e=0} =$ socio-demographic and job-related controls[1]

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[1] part-time status, age, age sq., tenure, tenure sq., years of education, past unemployment, public sector indicator, firm size, region, nationality, marital status, number of children

Estimated expected returns to experience

Estimating (1) using SOEP-IS yields

Table: Expected Annual Returns to Full-Time and Part-Time Experience

	(1)	(2)	(3)	(4)
Experience in Full-Time	0.017	0.015	0.019	0.016
	(0.001)***	(0.001)***	(0.001)***	(0.001)***
Experience in Part-Time	0.015	0.017	0.019	0.019
	(0.002)***	(0.001)***	(0.002)***	(0.001)***
Difference between Experience	−0.002	0.002	−0.000	0.003
	(0.002)	(0.001)	(0.002)	(0.001)**
N	1,799	1,857	2,555	2,635
Estimation	POLS	FE	POLS	FE
Incl. t=0	no	no	yes	yes

Notes: SOEP-IS (2016-2017). Unbalanced panel. Dep. Var. = Expected log gross hourly wage. Standard errors clustered at the person-level * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. POLS = Pooled OLS, FE = Fixed Effects. Regressions include controls for an indicator of part time work, the baseline (t=1) employment status, age, education, tenure, years of unemployment, region, migrational background, firm size, public sector employment, marital status and number of children.

$\rightarrow$ individuals expect same returns to experience in part-time and full-time
$\rightarrow$ no expected part-time penalty

Section 4

Realised Returns to Experience

Realised returns to experience in SOEP-Core

- SOEP-Core survey: tracks wages, hours, experience, occupation, education, family status over time

- We seek to uncover causal evidence about realised returns to experience

- A simple wage equation which is comparable to the specification for expected wages:

$$log\,\omega_{it} = \alpha + \eta PT_{it} + \zeta E_{it}^{Full} + \beta E_{it}^{Part} + X_i\gamma + \mu_i + \epsilon_{it}, \qquad (2)$$

- ω realized hourly wage

- PT_{it} indicator for part-time employment in the current period

- E_{it}^{Full} experience in full-time job (>32h/week) in years

- E_{it}^{Part} experience in part-time job (>5h and <32h/week) in years

- X socio-demographic and job-related controls[2]

- μ_i individual fixed effects

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[2] age, age sq., tenure, tenure sq., years of education, past unemployment, public sector indicator, firm size, region, nationality, marital status, number of children

Realised returns to experience: selection

- To identify the realised returns to experience we control for fixed effects and account for selection using a control function approach.
    - selection into employment (λ^e)
    - selection into employment state (λ^h)
    - endogeneity of experience in part-time (λ^p)
    - endogeneity of experience in full-time employment (λ^f)

- To construct control functions we exploit variation in the tax and transfer system over time as in Costa-Dias et. al. (2018) or Hammer (2020)
    - reforms to income taxation in 1996 and between 2000-2004
    - labor market reforms (Hartz reforms) between 2003-2005
    - parental leave reform in 2007

- Instruments
    - simulated out-of-work income, income in part-time employment and income in full-time employment
    - income varies over time due to reforms in the tax and transfer system
    - number and age of children, male earnings

First stage results

Realised returns to experience: control functions

$$log\omega_{it} = \alpha + \eta PT_{it} + \zeta E_{it}^{Full} + \beta E_{it}^{Part} + X_i\gamma$$
$$+ \mu_i + \lambda^e + \lambda^h + \lambda^f + \lambda^p + \epsilon_{it} \tag{3}$$

- ω hourly wage
- PT_{it} indicator for part-time employment in the current period
- E_{it}^{Full} experience in full-time job (>32h/week) in years
- E_{it}^{Part} experience in part-time job (>5h and <32h/week) in years
- μ_i individual fixed effects
- λ^x control functions

Estimation results SOEP-Core

	Low Education	Medium Education	High Education
Experience in Part-Time	0.003	-0.001	0.002
Experience in Full-Time	0.009***	0.014***	0.014***
N	15449	31025	11256

Notes: *p<0.1, **p<0.05, ***p<0.01 SOEP v35. 1992-2017. FE and Control Functions based on the four instruments defined above. Model accounts for the current employment state and includes and indicator for living in East Germany.

$\rightarrow$ only full-time experience generates wage growth

Section 5

Structural Analysis

Structural model incorporating beliefs

We develop a structural lifecycle model to quantify the implications of biased expectations on employment and lifetime earnings.

- A model of biased beliefs
  - ▶ given biased beliefs, preference parameters are estimated correctly, only if bias is explicitly included in the model structure
  - ▶ allow for wage process governing received wages to differ from process individuals base their decisions on

- Estimation
  - ▶ rationality assumption nested in the beliefs bias framework
  - ▶ exploit elicited expectations about labor market returns for identification

Outline of model components

Structural model with biased beliefs:

- Lifespan and choice set:
    - $age_t : 17, ..., 70$
    - education level as initial condition
    - choice variables: $l_t \in \{O, P, F\}$ and c_t
    - credit constraint; labor market frictions; tax and welfare system

- Unobserved heterogeneity:
    - $\theta = (\theta_p, \theta_f)$ - utility cost of work by individual type

- Exogenous model components:
    - childbirth, marriage and divorce, male wages

- Beliefs:
    - enter the wage equation
    - perceived experience accumulation in part-time allowed to differ from true experience accumulation process

Structural equations: Utility function

Flow utility:

$$u(c_t, l_t; \theta) = \frac{c_t^{\mu}}{\mu} exp \begin{cases} 0, & \text{if } l_t = O, \\ Z'\beta_P + \theta_P, & \text{if } l_t = P, \\ Z'\beta_F + \theta_F, & \text{if } l_t = F, \end{cases} \tag{4}$$

- c_t - consumption
- $l_t \in \{0, P, F\}$ - female labor supply
- μ - risk aversion, inter-temporal substitution
- $\theta = (\theta_P, \theta_F)$ - utility cost of work
- Z - presence of children, children-in-age-group dummies (0-2, 3-5, 6-10, older 10), presence of a partner, partner working indicator

Structural Equations: Budget constraint

$$\begin{cases} a_{t+1} = (1+r)a_t + h_t w_t + m_t \tilde{h}_t \tilde{w}_t - T(l_t, X_t) + CB - CC - c_t, \\ a_{t+1} = \underline{a_s}, \end{cases} \quad (5)$$

with initial and terminal conditions $a_0 = 0$ and $a_{\tilde{t}+1} \geq 0$.

- r - risk free interest rate

- $(w, \tilde{w})$ - hourly rates of wife and husband

- $(h, \tilde{h})$ - working hours of wife and husband

- $\underline{a_s}$ - borrowing limit

- T - tax and welfare transfer system

- CB - childcare benefits

- CC - childcare costs

Structural equations: Female market wage equation

$$\ln w_t^m = \gamma_{s,0} + \gamma_{s,1} \ln(e_t + 1) + \xi_t,$$
$$e_t = e_{t-1}(1 - \delta_s) + g_s(l_{t-1}), \tag{6}$$

where

- $\ln w_t^m$ - observed hourly wage rate
- ξ_t - i.i.d. normal contemporaneous error
- e_t - experience measured in years
- $s \in \{\text{low, middle, high}\}$ - level of education
- δ_s - per period depreciation rate
- $g_s(l_{t-1})$ - period rate of experience accumulation, with $g_s(N) = 0$, $g_s(F) = 1$ and $g_s(P) \in [0,1]$, where $g_s(P) = 0.5$ corresponds to no part-time penalty

Note: Specification benchmark to previous literature vs. reduced form regressions

Beliefs in the female perceived wage equation

Recall: True experience accumulation in part-time work: $g_s(P)$

$$e_t = e_{t-1}(1 - \delta_s) + g_s(P)$$

Beliefs components: Perceived experience accumulation: $\bar{g}_s(P)$

$$e_t = e_{t-1}(1 - \delta_s) + \bar{g}_s(P)$$

$$\bar{g}_s(P) = \alpha \cdot g_s(P)$$

where:

- Maintain normalisation: $g_s(F) = 1$, $g_s(N) = 0$ and obtain estimate of $\bar{g}_s(P)$
- α governs the degree of beliefs deviation from the true/realised returns to experience.

Structural estimation and counterfactuals results (prelim.)

- Estimation:
 - Period 2005-2017 and two regimes, no major changes in the tax and transfer system, but a major reform regarding parental leave in 2007
  - Method of Simulated Moments
  - Moments include statistics of:
    - ⋆ the wage distribution by education group and experience
    - ⋆ employment and transition rates by level of education, presence and age of child, and presence of a partner
  - Identification of beliefs bias parameter based on SOEP-IS data

- Analysis and counterfactual
  - Change in labor supply elasticities given between rational expectation and biased beliefs model
  - Counterfactual: de-biasing
  - Policy effect changes given beliefs bias

Counterfactual: de-biasing

- Individuals are aware of the part-time penalty

- Drop in part-time employment, increase in wages

- Note: both full-time employment and non-employment increase

- On average 8,2% drop in part-time rates; wages increase by 20 EUR per month

- Shifts most substantial for low educated and least pronounced for high educated
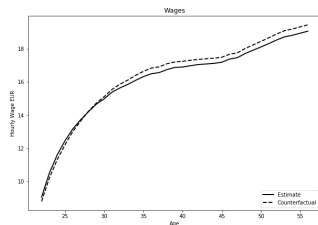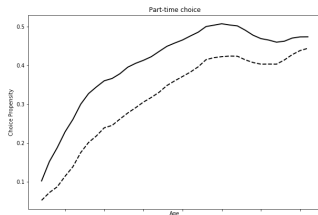
Section 6

Conclusion

Conclusion

In this paper we combine expectation about returns to experience, historical labor market data, and a structural life-cycle model to quantify the role of biased expectations for female labor supply and for public policy

- Expected returns to experience in part-time and full-time work do not differ; no expected part-time penalty
- Reduced form evidence for part-time penalty over the life-cycle for females in Germany
- Introduce biased expectations in a structural model
- De-biasing reduces propensity of part-time choice over all periods.
- welfare increasing policies should stimulate full-time work

Thank you!

Female part-time employment in Germany

- Size and trend of female part-time employment in Germany

Female Part-Time Employment Rate
(All Women, 1992-2017)

GSOEP V.34 (2017). Means weighted.
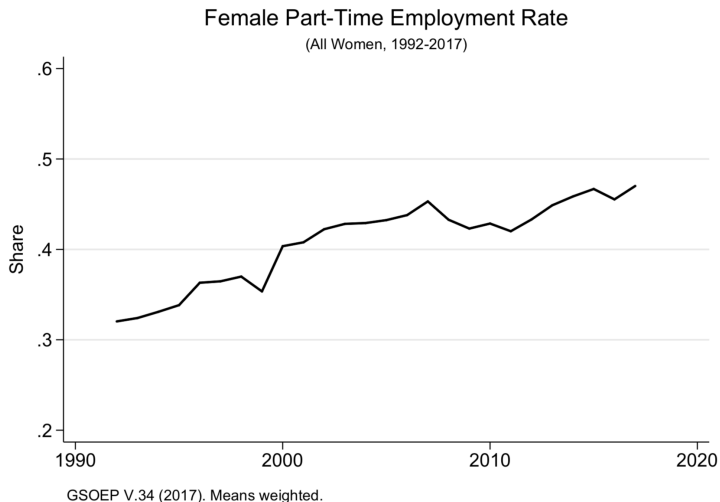
Part-time shares by presence of children

Part-Time Employment over the Life Cycle
(All Women, 1992-2017)
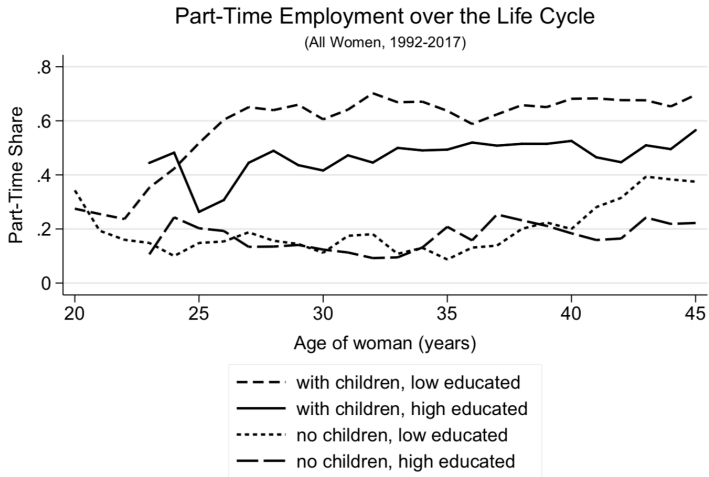
GSOEP V.34 (2017). Means weighted.

Part-time share after first child
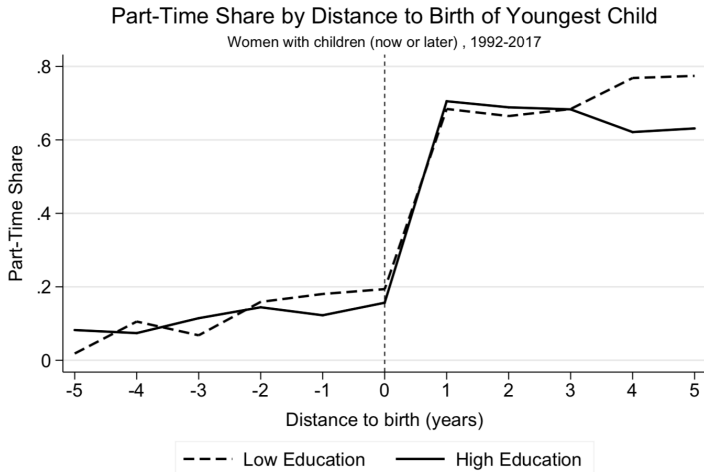
Part-Time Share by Distance to Birth of Youngest Child

Women with children (now or later) , 1992-2017

GSOEP V.34 (2017). Means weighted.

Part-time penalty over the life-cycle

Wage Trajectories in Full- and Part-Time

Women observed in full- or part-time at age 50

GSOEP V.34 (2017). Own calculations. N=3185 at age 50. Pooled sample 1992-2017.

Previous innovative modules SOEP-IS

Examples:

- internalized gender stereotypes

- day reconstruction method (DRM)

- job pref's and willingness to accept job offer

- overconfidence in different life domains

- grit and entrepreneurship

- sickness presenteism

- perceived discrimination

- expected financial market earnings

- epigenetic markers of stress

- separating systematic measurement error components using MTMM in longitudinal studies

Sample and socio-demographics wave 2016

	Total			Fulltime			Parttime		
	Core	IS	p-value (Δ)	Core	IS	p-value (Δ)	Core	IS	p-value (Δ)
Fulltime	0.47	0.49	0.66	1.00	1.00	.	0.00	0.00	.
Real Gross Hourly Wage	15.74	16.25	0.36	17.17	18.14	0.33	14.35	15.53	0.06
Actual Working Hrs.	31.62	30.90	0.42	41.70	42.76	0.06	22.43	25.18	0.00
Contractual Hrs.	29.66	28.72	0.23	38.30	39.27	0.01	21.37	22.76	0.07
Age	43.56	42.02	0.03	42.21	42.04	0.89	45.53	44.88	0.48
East Germany	0.17	0.15	0.23	0.20	0.19	0.76	0.15	0.16	0.89
Married	0.56	0.64	0.00	0.41	0.51	0.03	0.66	0.79	0.00
Children	0.35	0.34	0.72	0.18	0.14	0.23	0.41	0.44	0.49
German Nationality	0.79	0.77	0.49	0.84	0.84	0.94	0.80	0.79	0.96
Years of Education	12.25	12.24	0.92	12.72	12.72	0.98	12.03	12.24	0.22
Tenure	9.64	9.72	0.89	10.36	10.22	0.89	8.99	10.11	0.18
Firm: Public Sector	0.25	0.28	0.36	0.25	0.27	0.70	0.25	0.29	0.25
Firm: Large Firm	0.47	0.48	0.86	0.52	0.54	0.68	0.42	0.46	0.47
N	10,000	441		2,559	138		3,868	148	

Note: All estimates weighted.

Table: Socio-Demographic Characteristics (SOEP Core vs. SOEP IS, 2016)

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Sample and socio-demographics wave 2017

	Total			Fulltime			Parttime		
	Core	IS	p-value (Δ)	Core	IS	p-value (Δ)	Core	IS	p-value (Δ)
Fulltime	0.46	0.44	0.69	1.00	1.00	.	0.00	0.00	.
Real Gross Hourly Wage	15.98	16.00	0.98	17.41	16.72	0.38	14.67	16.62	0.06
Actual Working Hrs.	31.27	29.88	0.21	41.57	42.16	0.33	22.34	24.88	0.05
Contractual Hrs.	29.43	27.72	0.09	38.49	38.68	0.70	21.16	22.42	0.24
Age	43.69	41.57	0.01	42.38	42.31	0.97	45.30	43.65	0.21
East Germany	0.16	0.14	0.21	0.21	0.26	0.26	0.14	0.09	0.17
Married	0.57	0.66	0.00	0.40	0.44	0.49	0.67	0.74	0.12
Children	0.35	0.39	0.36	0.18	0.17	0.82	0.41	0.38	0.58
German Nationality	0.79	0.74	0.23	0.84	0.91	0.08	0.80	0.69	0.10
Years of Education	12.29	12.24	0.73	12.69	12.63	0.77	12.12	12.35	0.40
Tenure	9.63	8.63	0.17	10.19	10.58	0.76	9.16	8.01	0.24
Firm: Public Sector	0.26	0.27	0.64	0.26	0.32	0.25	0.25	0.30	0.43
Firm: Large Firm	0.50	0.50	0.98	0.56	0.55	0.87	0.45	0.56	0.07
N	11,324	303		2,920	93		4,321	101	

Note: All estimates weighted.

Table: Socio-Demographic Characteristics (SOEP Core vs. SOEP IS, 2017)

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Probabilistic add-on questions (I)
Current working hours: Future income

Probability lower income
How likely do you think it is that, in one year[3], your full-time *(part-time)* job
yields a gross income of *less* than X-20% per month?

Probability higher income
How likely do you think it is that, in one year[4], your full-time *(part-time)* job
yields a gross income of *more* than X+20% per month?

Please report your answer in percent. 0% means that you consider it impossible,
100% means that you are certain. You can use the percent values in between to
graduate your answer.

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[3]... in 2 years/ ... in 10 years
[4]... in 2 years/ ... in 10 years

Probabilistic add-on questions (II)

Hypothetical working hours: Today

Probability lower income
How likely do you think it is that a part-time *(full-time)* position at 20 *(40)* hours per week yields a gross income of *less* than X-20% per month?

Probability higher income
How likely do you think it is that a part-time *(full-time)* position at 20 *(40)* hours per week yields a gross income of *more* than X+20% per month?

Please report your answer in percent. 0% means that you consider it impossible, 100% means that you are certain. You can use the percent values in between to graduate your answer.

Probabilistic add-on questions (III)

Hypothetical working hours: Future income

Probability lower income
How likely do you think it is that, in one year[5], your part-time *(full-time)* job
yields a gross income of *less* than X-20% per month?

Probability higher income
How likely do you think it is that, in one year[6], your part-time *(full-time)* job
yields a gross income of *more* than X+20% per month?

Please report your answer in percent. 0% means that you consider it impossible,
100% means that you are certain. You can use the percent values in between to
graduate your answer.

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[5] ... in 2 years/ ... in 10 years
[6] ... in 2 years/ ... in 10 years

Robustness and power analysis

$\rightarrow$ key findings are robust to: probabilistic questions as outcomes, non-parametric specifications to experience, price adjusted wages

$\rightarrow$ next: confirm results when asking for hourly wages instead of monthly earnings

Table: Expected Wage Growth: Power Analysis

	1 year			2 year			10 year		
	Full-time	Part-time	E(PT) s.t.< FT	Full-time	Part-time	E(PT) s.t.< FT	Full-time	Part-time	E(PT) s.t.< FT
All Females	3.32	4.39	-0.00	6.82	9.71	2.38	20.68	25.27	13.10
Employment									
Full-Time	5.06	4.68	-0.53	9.41	10.12	2.38	26.34	25.69	14.64
Part-Time	1.73	4.13	-2.06	4.47	9.33	-1.09	15.54	24.88	5.75
Education									
Low	4.53	2.97	-7.08	7.80	7.93	-5.86	19.37	20.94	1.74
Medium	2.64	3.65	-0.73	6.06	8.33	1.55	19.06	24.36	10.41
High	5.15	7.74	-5.24	9.06	15.50	-5.17	27.14	30.64	5.88
Age									
< 35 years	6.57	4.73	0.89	12.24	14.90	2.52	29.29	36.51	11.22
35-45 years	1.97	7.49	-6.56	5.27	11.99	-5.21	18.21	26.83	3.03
> 45 years	2.03	2.27	-1.92	4.25	4.93	0.19	16.60	17.00	8.96
Region									
East	2.00	3.47	-4.30	5.49	6.66	-2.41	17.32	18.64	5.32
West	3.58	4.57	-0.20	7.08	10.30	2.00	21.34	26.56	12.60

Notes: SOEP-IS (2016-2017). Balanced panel (N=233 observations). We report expected growth in hourly wages (in %), calculated in relation to observed hourly wage in the base period. E(PT) s.t.<FT reports the value of expected part-time wage growth we would need to observe to give significantly lower wage growth than in full-time, given sample size and a power of 0.8.

First Stage: Employment

	Low Education	Medium Education	High Education
Simulated income (non employment)	0.143***	0.220***	0.282***
One child	-0.168***	-0.454***	-0.464***
Two children	-0.511***	-0.684***	-0.668***
Three or more children	-1.08***	-1.151***	-1.079***
Number of observations	51,250	68,833	24,886
χ^2	25.22	70.65	52.21
p-value	0.000	0.000	0.000

Notes: *p¡0.1, **p¡0.05, ***p¡0.01 SOEP v35, estimated by Probit. Sample includes women who work and who do not work. All models include a dummy for east Germany.

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First Stage: Part-time work

Table 6: First stage - Part-time work

	Low Education	Medium Education	High Education
Residuals of Fulltime Work	-0.066	-0.238***	0.036
Difference FT- to PT-Residuals	1.164***	0.598***	0.929***
Age	0.136**	0.373***	0.358***
Age^2	-0.004***	-0.010***	-0.009***
Age^3	0.000***	0.000***	0.000***
Age of Oldest Child			
2 or less	0.037	0.006	-0.968***
3 to 5	-0.517***	-0.459***	-0.306***
6 to 10	-0.453***	-0.388***	-0.334***
11 to 17	-0.287***	-0.344***	-0.247***
Age of Youngest Child			
2 or less	-1.165***	-1.456***	-1.310***
3 to 5	-1.200***	-1.438***	-1.180***
6 to 10	-1.040***	-1.228***	-0.884***
11 to 17	-0.644***	-0.814***	-0.505***
N	25,002	47,155	18,472
χ^2	993.32	2960.67	752.63
p-value	0.000	0.000	0.000

First Stage: Full-time experience

Table 7: First stage - Fulltime experience

	Low Education	Medium Education	High Education
Residuals Fulltime	0.625	-0.221	0.434
Difference FT- to PT-Residuals	10.369***	4.875***	6.486***
Age	2.023***	3.040***	3.473***
Age^2	-0.033***	-0.058***	-0.067***
Age^3	0.000***	0.000***	0.001***
Age of Oldest Child			
2 or less	-0.363	0.672	-0.545
3 to 5	-0.871*	-0.219	-0.883**
6 to 10	-1.486***	-1.427***	1.891***
11 to 17	-3.005***	-2.932***	-2.758***
Age of Youngest Child			
2 or less	-1.033***	-1.754***	-1.907***
3 to 5	-1.827***	-2.630***	-2.571***
6 to 10	-2.643***	-3.318***	-3.143***
11 to 17	-3.529***	-4.150***	-3.285***
N	24320	45844	16507
F-statistic	252.37	586.00	351.13
p-value	0.000	0.000	0.000

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First Stage: Part-time experience

	Low Education	Medium Education	High Education
Residuals Fulltime	0.925**	0.610***	0.008
Difference FT- to PT-Residuals	-4.670***	-2.304***	-3.550***
Age	-0.476*	-1.225***	-1.807***
Age^2	0.014*	0.033***	0.046***
Age^3	-0.000	-0.000***	-0.000***
Age of Oldest Child			
2 or less	0.037	-0.942**	0.895
3 to 5	0.391	-0.308*	0.409
6 to 10	0.419**	0.376***	0.634***
11 to 17	0.757***	0.897***	1.205***
Age of Youngest Child			
2 or less	0.334	0.600***	0.501**
3 to 5	0.448**	0.932***	1.113***
6 to 10	0.990***	1.649***	1.625***
11 to 17	1.591***	2.383***	1.869***
N	24320	45844	16507
F-statistic	145.42	319.92	54.77
p-value	0.000	0.000	0.000