

Temporary part-time employment and future wages of male employees – a panel data analysis of the German labour market

Piotr Matuszak^a

Abstract. The aim of this study is to assess the relationship between temporary part-time employment and the wages male employees receive in subsequent full-time employment within the first five and the first ten years from the date of starting their full-time employment. The study uses data from the German labour market, obtained from the Socio-Economic Panel for the years 1984–2014. The fixed effects estimator, which solves the unobserved heterogeneity issue by removing time-invariant individual effects by a ‘within’ transformation, was applied in the empirical analysis. The results indicate that having experience as a part-time worker is associated with lower future wages – a one-year increase in the number of years in part-time work in the last two to five years leads to a reduction in future wages in a full-time job by 4.4% on average, compared to having solely a full-time job experience. However, this relationship becomes statistically insignificant after five years of being employed full-time. The results are robust to different specifications and it is indicated that an inverse relationship between working below regular hours and future wages in full-time employment is related to working part-time in low- and medium-skilled occupations. At the same time, working part-time is less detrimental to future wages than periods of unemployment.

Keywords: part-time employment, part-time wages effects, German labour market

JEL: C33, J24, J31

Praca tymczasowa w niepełnym wymiarze a przyszłe wynagrodzenie mężczyzn – analiza panelowa niemieckiego rynku pracy

Streszczenie. Celem badania przedstawionego w artykule jest ocena związku między pracą tymczasową w niepełnym wymiarze wykonywaną przez mężczyzn a płacą, jaką otrzymują oni w ciągu pierwszych pięciu i dziesięciu lat od momentu zatrudnienia w pełnym wymiarze czasu pracy. W analizie empirycznej posłużono się danymi dotyczącymi niemieckiego rynku pracy pochodzącymi z Panelu Społeczno-Ekonomicznego za lata 1984–2014. Zastosowano estymator z efektami stałymi, który rozwiązuje problem nieobserwowalnej heterogeniczności poprzez transformację wewnątrzgrupową. Wyniki wskazują, że doświadczenie zatrudnienia w niepełnym wymiarze czasu pracy wiąże się z niższym przyszłym wynagrodzeniem – dodatkowy rok pracy w niepełnym wymiarze w okresie ostatnich dwóch do pięciu lat prowadzi do obniżenia płacy średnio o 4,4% w porównaniu z doświadczeniem pracy w pełnym wymiarze. Jednak po pięciu latach zatrudnienia w pełnym wymiarze czasu pracy związek ten jest już nieistotny statystycznie. Wyniki są stabilne przy różnych specyfikacjach modeli. Wykazano, że odwrotna zależność między pracą w niepełnym wymiarze a przyszłą płacą ma związek z doświadczeniem

^a Uniwersytet Ekonomiczny w Poznaniu, Instytut Ekonomii. ORCID: <https://orcid.org/0000-0003-4572-3168>.

zatrudnienia w zawodach wymagających niskich i średnich kwalifikacji. Jednocześnie doświadczenie pracy w niepełnym wymiarze jest mniej niekorzystne dla przyszłego wynagrodzenia niż okresy braku zatrudnienia.

Słowa kluczowe: niepełny wymiar czasu pracy, płaca, niemiecki rynek pracy

1. Introduction

The phenomenon of part-time employment has been broadly discussed in literature as a result of an increasing number of employees working fewer than regular hours. Researchers in this field focus not only on the impact of part-time work on current wages and job positions, but also on the issue of future employment and salaries. Part-time jobs may be seen as non-optimal positions and they can affect employees in various ways, for example in the form of lower future wages once becoming full-time workers. The main reasons for such a deterioration in future earnings might lie in the negative signalling effects and reduced human capital accumulation.

While part-time employment may be perceived as a means to signal employees' skills when they are otherwise difficult to evaluate, and, consequently, become a stepping stone towards full-time employment (Bollé, 1997; Buddelmeyer et al., 2005; Farber, 1999; Kyyrä et al., 2017; Månsson & Ottosson, 2011), a part-time job experience is often interpreted by employers as a sign of low productivity and/or a lack of high labour force attachment and motivation (Biewen et al., 2018; Connolly & Gregory, 2009). This, in turn, leads to lower future wages and reduces the probability of being offered a full-time job (Connolly & Gregory, 2009; Tam, 1997).

Another explanation of the potentially lower wages of former part-time employees is connected to limited human capital accumulation. Employees working below the standard number of hours accumulate less human capital and experience than the full-time employed in the same period (Hirsch, 2005). Moreover, part-time employment is often related to occupational downgrading and working below one's qualifications, which leads to the further deterioration in human capital (Connolly & Gregory, 2008; Manning & Petrongolo, 2008). Additionally, as Nelen and de Grip (2009) demonstrate, part-time workers receive less support from companies in terms of investment in their human capital, compared to their full-time counterparts.

Empirical analyses suggest rather negative effects of part-time employment on future wages – former part-time workers are likely to receive lower salaries in both part-time and full-time employment compared to workers with only full-time work experience. Connolly and Gregory (2009) show that part-time work leads to low returns in future earnings for British women, substantially more so in low-skilled jobs. Similarly, Blundell et al. (2016) indicate that part-time jobs for women in the UK are of low value in terms of human capital accumulation; moreover, they are associat-

ed with low wage trajectories compared to full-time employment. The causal effect of part-time work on female workers in Germany was researched by Paul (2016) and the results suggest that part-time employment negatively affects future wages (when compared to full-time work), which refers in particular to women working less than 15 hours a week.

Despite the fact that there are several empirical studies discussing the effects of part-time employment on future wages, they focus solely on the careers of female employees. As indicated by Biewen et al. (2018, p. 5 and 6), no detailed analysis of this issue with regard to men has been conducted to date.

Therefore, the aim of this study is to assess the relationship between temporary part-time employment and the wages male employees receive in subsequent full-time employment within the first five and the first ten years from the date of starting their full-time employment. The aforementioned aim allows the formulation of two research hypotheses:

- H1: temporary part-time work is associated with lower future wages (when compared to full-time employment) after the first year of being employed full-time;¹
- H2: temporary part-time work is associated with lower future wages (when compared to full-time employment) for longer than five years.

2. Research method

Data from the German Socio-Economic Panel (SOEP), Wave 31, covering the years 1984–2014, were used in the analysis.² This dataset was chosen for two reasons. Firstly, it is a very comprehensive set covering a broad range of characteristics of respondents over an extensive period, which makes it possible to employ a within variation of a number of individuals in an econometric analysis. Secondly, Germany is a country where the rate of men working part-time has increased substantially over the last decades, i.e. from approximately 2% in the early 1990s to over 9% in recent years (OECD, 2019), which is one of the most dynamic changes noted in the EU.

The sample consisted of men aged 18–58 whose course of employment was observed for at least five successive years. Men who were self-employed were excluded from the study the year they entered this status. The definition of part-time employment used in this study is based on the classification of OECD (2016), which adopted the term ‘part-time employee’ to describe those who work less than 30 hours per

¹ The distinction of the first year after entering full-time employment is made to control, to some extent, for the effects of the possible change of employer and the loss of job-specific human capital (Fitzenberger et al., 2016), which tend to be larger directly after the change.

² For a more detailed description of the SOEP, see Wagner et al. (2007). This time span was selected as the full version of SOEP’s Wave 31 was available at the time when the research herein was initiated.

week. The minimum number of working hours required to be classified in the analysis was one. To calculate the hourly wage, the gross monthly real wage (in euros, as of 2005) was divided by the number of hours worked. Since the SOEP data contain information on wages in the current month and the question on the number of hours worked relates to the week prior to the SOEP interview, the application of the actual hours worked could have led to misleading results. Therefore, the information on contractual hours was used to measure the hours worked – this approach was employed by, e.g., Paul (2016). Although the question about contractual hours also relates to the week before the SOEP interview, it may be argued that this value tends to be less volatile than the actual hours worked.³

The data used in the analysis consist of 126,023 observations. 14,348 men were observed, on average, for over 13 years. The minimum number of observed periods for one person was five, and the maximum 31. Table 1 presents a summary of the statistics describing the sample applied in this study. The average wage per hour was EUR 17.27 (in euros, as of 2005) in the period of 1984–2014. The mean value of contractual hours per week was 38.61; 39.20 for full-time and 19.46 for part-time workers. The average age of the men whose careers were analysed was 38.97 and the age group of 50–58 was represented most extensively in the analysis. 15% of the observations referred to men who lived in East Germany.

Table 1. Summary statistics, men aged 18–58, years examined 1984–2014

Variable	Number of observations	Mean
<i>Wage per hour</i>	81,404	17.27
<i>Hours</i>	103,703	38.61
<i>if full-time</i>	100,691	39.20
<i>if part-time</i>	3,012	19.46
<i>Age</i>	126,023	38.97
18–23	126,023	0.11
24–29	126,023	0.14
30–34	126,023	0.13
35–39	126,023	0.13
40–44	126,023	0.13
45–49	126,023	0.13
50–58	126,023	0.23
<i>Place of residence: East Germany</i>	126,023	0.15

Note. *Wage* is presented in the 2005 constant euros. *Hours* refers to job hours per week. *Age* groups and *Place of residence: East Germany* are dummy variables – their average values represent the share of individuals classified in a particular group in the sample. Weighted statistics are presented. Individuals' cross-sectional weights for all SOEP samples (W11105 in the SOEP database) were employed in order to compensate for unequal probabilities of selection and sample attrition and to obtain populations-based statistics.

Source: author's work based on SOEP data for the years 1984–2014.

³ To verify the robustness of the results, an analysis employing actual worked hours was conducted. See Table 5, Model 7.

As previously mentioned, the rate of part-time employment among men has increased substantially in Germany over recent years. Based on the SOEP data, the percentage of men in part-time employment increased from nearly 2% in the years 1984–1989 to almost 8% in 2014. Since the growing role of part-time employment suggests that the profile of an employee working less than 30 hours per week might also have changed, periods of lower and higher rates of part-time employment need to be distinguished. Therefore, the following analysis presents also data for the periods 1984–2001 and 2002–2014 separately.⁴

Table 2 presents the employment status of the men from the sample used in this study. It should be pointed out that in the years 1984–2014, part-time employment (PT) constituted on average 2.47% of the total employment of men and it increased after the year 2001. More than 80% of the men from the sample were working full-time (FT) and 17.21% were non-employed (NE) in the period 1984–2014.

Table 2. Structure of employment status, men aged 18–58

Employment status	1984–2014	1984–2001	2002–2014
	in %		
FT	80.32	81.47	78.51
PT	2.47	2.22	2.87
NE	17.21	16.31	18.62

Source: author's work based on the SOEP data for the years 1984–2014.

Table 3. Structure of occupations by employment status, men aged 18–58

Skill level of occupation	FT	PT		
		1984–2001	2002–2014	
	in %			
High-skilled	36.71	53.14	62.98	41.64
Medium-skilled	57.50	28.74	24.83	33.77
Low-skilled	5.79	18.12	12.19	24.59

Source: author's work based on SOEP data for the years 1984–2014.

Skill levels of occupations by employment status are presented in Table 3.⁵ It should be noted that most part-time workers were employed in high-skilled occupa-

⁴ The year 2002 is treated as a threshold as it was the first year with a higher-than-average rate of part-time employment within the period of 1984–2014.

⁵ Skill levels of occupations are based on the first digit of the International Standard Classification of Occupations (ISCO): high-skilled jobs – managers, professionals, technicians and associate professionals, armed forces (1–3; 10); medium-skilled jobs – clerical support workers, service and sales workers, skilled agricultural and fishery workers, craft and related trades workers, plant and machine operators, assemblers (4–8); low-skilled jobs – elementary occupations (9). This classification is used in, e.g., OECD (2012).

tions, whereas among those employed full-time there were proportionally fewer high-skilled employees. Likewise, the proportion of part-time employees in low-skilled occupations was higher than a similar proportion of full-time employees. Among all types of occupations, part-time employees were employed in medium-skill-level occupations least often. However, the percentage of part-time employees in high-skilled occupations decreased after 2001 (from 62.98% to 41.64%), and at the same time increased in low-skilled occupations (from 12.19% to 24.59%).

The fact that there is a large number of employees working less than 30 hours a week in high-skilled jobs is not surprising when analysing a more detailed classification of occupations (based on the 2-Digit Industry Code in the SOEP). Most part-time employees, 25.46%, were employed in jobs from the Education and Sport category, where 42.25% of teachers had less than 30 contractual hours per week in the analysed period. However, the percentage of part-time teachers fell from over 50% in the years 1989–1993 to 33% in 2014. When teachers were excluded from the analysis, high-skilled occupations accounted for 39.28% of the whole part-time employment sector, and low-skilled occupations for 23.16%. Other job categories with the highest part-time employment rates were Restaurants (12.97%) and Health Services (7.13%).

Table 4. Average wages per hour by employment status, men aged 18–58

Employment status	1990–2014	1990–2001	2002–2014
	in euros of 2005		
FT	17.11	16.72	17.58
PT	22.81	26.64	18.54
PT, excluding teachers	19.06	21.78	16.66

Source: author's work based on SOEP data for the years 1990–2014.

Employees working part-time earned higher hourly wages on average in the years 1990–2014, both when including and when excluding teachers (see Table 4). However, after the year 2001, there was a wage gap between part-time employees and full-time employees when teachers were not considered.

The descriptive statistics presented in this part of the study demonstrate that with the increasing role of part-time employment its characteristics changed. Before the year 2002, working less than 30 hours a week was primarily associated with high-skilled occupations with a wage premium (compared to full-time employment), mostly teachers. After 2002, more part-time employees were working in medium- and low-skilled jobs, receiving lower hourly wages.

This study uses data which comprise time series for each cross-sectional object. In order to choose between panel data models and a simple ordinary least squares (OLS) regression in the empirical analysis, the Breusch-Pagan Lagrange multiplier

test (Breusch & Pagan, 1980) was conducted. Its results show that the null hypothesis on zero variance across entities can be rejected (at the 0.01 significance level), which, in turn, implies that significant unobserved differences across individuals occur in the dataset, and therefore the OLS regression would not be a suitable method in this study. Fixed effect and random effect models are considered the basic solutions to the unobserved heterogeneity issue in panel data (Wooldridge, 2002). The choice between fixed effect and random effect models is based on the possible rejection of the orthogonality assumption, which means that one needs to verify whether time-invariant unobserved heterogeneity is correlated with explanatory variables. The Hausman test (Hausman, 1978), which examines differences between the coefficients obtained when employing both methods, was conducted, and its results suggest that the null hypothesis on non-systematic differences in coefficients can be rejected (at the 0.01 significance level). Therefore, the fixed effects model, which makes it possible for time-invariant omitted variables to be arbitrarily correlated with explanatory variables, should be the one applied in this analysis.

The fixed effects estimator is a pooled ordinary least squares estimator from the regression on time-demeaned data (Wooldridge, 2002, pp. 265–279). This transformation is most often called the ‘within’ or ‘fixed effects’ transformation and it solves the unobserved heterogeneity issue by removing time-invariant individual effects by means of time-demeaning. In this analysis, the relationship between part-time work experience and future wages is identified through employees who change their employment status, and the potential time-invariant determinants of wage levels – including the unobservable ones, such as intelligence, innate skills and talent – are controlled for by the fixed effects model. Since this study focuses on the relationship between temporary part-time work and the future wages in full-time employment, observations are limited to the then current full-time employees, which allows a comparison of the wages of full-time employees with part-time work experience to the wages of full-time workers with full-time work experience and the wages of full-time employees who were formerly non-employed.

The estimated model within the fixed-effects framework takes the following form:

$$\begin{aligned}
 l\text{wage}_{it} = & \beta_0 + \beta_1 PT_{it-1} + \beta_2 \sum_{s=2}^5 PT_{it-s} + \beta_3 \sum_{s=6}^{10} PT_{it-s} + \beta_4 NE_{it-1} + \\
 & + \beta_5 \sum_{s=2}^5 NE_{it-s} + \beta_6 \sum_{s=6}^{10} NE_{it-s} + \mathbf{c}'_{it} \boldsymbol{\alpha} + \varepsilon_{it},
 \end{aligned}$$

where:

$l\text{wage}$ – log of hourly wages of the current full-time employees,

- PT – part-time employment status,
 NE – non-employment status,
 c – vector of control variables consisting of age groups, dummy variables indicating if a person lived in East Germany or rural areas and time dummies to control for common shocks,
 β_2, β_3 – parameters of interest by the variables indicating part-time experience,
 α – vector of parameters by control variables.

Clustered standard errors were calculated.

3. Results

Tables 5 and 6 present the results of the fixed effects estimation.⁶

Table 5. Past employment states and future full-time wages, dependent variable: log of real hourly wages

Specification	Model (years)						
	1 (1994–2014)	2 (1994–2001)	3 (2002–2014)	4 (1990–2014)	5 (1994–2014)	6 (1994–2014)	7 (1994–2014)
PT .....	.	.	.	.	0.315*** (0.05)	.	.
PT_{t-1}	-0.104*** (0.03)	-0.071* (0.04)	-0.107** (0.05)	-0.106*** (0.03)	-0.172*** (0.03)	-0.108*** (0.04)	-0.068** (0.03)
$\sum_{s=2}^5 PT_{t-s}$	-0.044** (0.02)	-0.023 (0.02)	-0.031* (0.02)	-0.043*** (0.01)	-0.029* (0.01)	-0.046** (0.02)	-0.040** (0.02)
$\sum_{s=6}^{10} PT_{t-s}$	-0.018 (0.01)	0.001 (0.02)	-0.012 (0.01)	.	-0.014* (0.01)	-0.019 (0.01)	-0.001 (0.01)
NE_{t-1}	-0.115*** (0.02)	-0.103*** (0.02)	-0.114*** (0.02)	-0.109*** (0.01)	-0.121*** (0.02)	-0.115*** (0.02)	-0.113*** (0.02)
$\sum_{s=2}^5 NE_{t-s}$	-0.053*** (0.01)	-0.078*** (0.01)	-0.034*** (0.01)	-0.082*** (0.01)	-0.054*** (0.01)	-0.053*** (0.01)	-0.051*** (0.01)
$\sum_{s=6}^{10} NE_{t-s}$	-0.025*** (0.00)	-0.028*** (0.01)	-0.016*** (0.01)	.	-0.022*** (0.00)	-0.025*** (0.00)	-0.024*** (0.00)
Age groups, East Germany, rural area, year dummies, intercept	yes	yes	yes	yes	yes	yes	yes
FT .....	.	.	.	.	ref.	.	.
Teacher dummies	no	no	no	no	no	yes	no
N	20,332	6,936	13,396	43,543	20,701	20,332	20,341

Note. Clustered standard errors are reported in parentheses. Asterisks denote significance levels: *** – 0.01, ** – 0.05, * – 0.1; ref. – reference group. Observations consist of current full-time employees. Model 5 contains also current part-time workers. In Model 7, actual worked hours were used. Detailed results are presented in the Appendix, Tables A1–A4.

Source: author's work supported by Stata 15 (xtreg package) and data from SOEP.

⁶ For detailed results, see the Appendix, Tables A1–A5.

Table 6. Past employment states and future wages – skill levels of occupations, dependent variable: log of real hourly wages

Specification	Model 8 (years 1994–2014)	Specification	Model 8 (years 1994–2014)	Specification	Model 8 (years 1994–2014)
<i>FThigh</i>	ref.	$\sum_{s=2}^5 PThigh_{t-s}$	-0.012 (0.02)	$\sum_{s=2}^5 NE_{t-s}$	-0.095*** (0.01)
<i>PThigh</i>	0.309*** (0.05)	$\sum_{s=2}^5 PTmedium_{t-s}$	-0.042** (0.02)	$\sum_{s=6}^{10} NE_{t-s}$	-0.023*** (0.01)
<i>PTmedium</i>	0.318*** (0.10)	$\sum_{s=2}^5 PTlow_{t-s}$	-0.090*** (0.03)	<i>Age groups, East Germany, rural area, year dummies, intercept</i>	
<i>PTlow</i>	0.319*** (0.09)	$\sum_{s=6}^{10} PThigh_{t-s}$	0.002 (0.01)	<i>FT occupations dummies</i>	yes
<i>PThigh_{t-1}</i>	-0.164*** (0.03)	$\sum_{s=6}^{10} PTmedium_{t-s}$	-0.041*** (0.01)	<i>Teacher dummies</i>	yes
<i>PTmedium_{t-1}</i>	-0.199*** (0.04)	$\sum_{s=6}^{10} PTlow_{t-s}$	-0.020 (0.03)	<i>N</i>	20,701
<i>PTlow_{t-1}</i>	-0.142* (0.08)	<i>NE_{t-1}</i>	-0.127*** (0.01)		

Note. Clustered standard errors are reported in parentheses. Asterisks denote significance levels: *** – 0.01, ** – 0.05, * – 0.1; ref. – reference group. Observations consist of the current full-time and part-time employees. Detailed results are presented in the Appendix, Table A5.

Source: author’s work supported by Stata 15 (xtreg package) and data from SOEP.

The first column includes the estimates from the analysis of the data from the years 1994–2014⁷ (Model 1). It shows that an increase of one year in part-time work experience in the last five years (excluding the last year) decreases the current hourly wage by 4.4% on average (compared to full-time work experience) and this relationship is statistically significant at the 0.05 level. At the same time, no statistically significant (of 0.1 level) relation was observed between working part-time six to ten years earlier and the wages earned in the future full-time job. In comparison, the coefficients of both variables indicating non-employment in the past years suggest a stronger negative correlation (5.3% for the last five years; 2.5% six to ten years earlier) and are significant at the 0.01 level.

In Models 2 and 3, observations were divided into periods 1994–2001 and 2002–2014. An inverse relationship between working part-time and future wages proved statistically insignificant after the first year from switching to full-time employment in the years 1994–2001. In the second analysed period, the coefficient of the variable indicating previous experience of part-time work within five years equalled -3.1% and was significantly different from zero at the 0.1 level. As previously, the experi-

⁷ This time span is necessitated by the fact that the model includes variables indicating the job status in the last ten years, and, while having access to SOEP data for the period from 1984 to 2014, variables on the past ten years are available starting only from 1994.

ence of part-time employment was not statistically significant (at the 0.1 level) after five years of working full-time. In both models, an increase in the number of years of non-employment in the past was associated with lower future wages and this relationship was of high statistical significance.

These results suggest that the H1 hypothesis cannot be rejected while there is sufficient evidence to reject the H2 hypothesis.

4. Robustness check

In the first step of the robustness check,⁸ the variable indicating work experience of six to ten years was excluded, which allowed to roughly double the number of observations in regression and increased the time span to the years 1990–2014⁹ (Table 5, Model 4). Then, both the current full-time and part-time workers were considered. Consequently, the relationship between part-time work experience and wages of employees working currently less than 30 hours a week (Model 5) was possible to examine. Since the characteristics of teachers in part-time employment differ from those of other workers, interaction terms capturing part-time experience of this professional group were included (Model 6). In the next step, the actual worked hours instead of contractual working hours were used (Model 7). Finally, skill levels of occupations were taken into consideration to see whether the obtained results held for the different job groups (Table 6, Model 8).

The results of the analysis including only variables indicating work experience in the last five years (Model 4) demonstrate that each additional year in part-time work in the previous two to five years was associated with, on average, a 4.3%-decrease in wages, compared to the experience in full-time employment, and this relationship is highly significant. The magnitude is very close to the value obtained in Model 1 (–4.4%).

Both those working less than 30 hours a week and those working at least 30 hours a week in the years 1994–2014 were included in Model 5. Coefficients of the variables indicating part-time experience equalled –2.9% (two to five years) and –1.4% (six to ten years), and are significant at the 0.1 level.

When interaction terms to control for teachers were introduced (Model 6), the coefficient of the variable indicating experience in part-time employment in the previous two to five years was of a slightly greater magnitude (–4.6%) than in the basic specification, and was significant at the 0.05 level. The coefficient of the variable representing part-time experience of over five years was insignificantly different from zero.

⁸ Detailed results of the robustness check are available in the Appendix, Tables A1–A5.

⁹ Technically, the time span could also cover the year 1989, however, the analysis starts with the year 1990 as it is the first period taking into account former East Germany.

When the actual worked hours were considered (Model 7), a link between part-time experience up to five years (excluding the previous year) and future wages was identified as negative and significant at the 0.05 level. Its magnitude was slightly lower than in the basic specification (−4.0%). The relationship between part-time work experience from before six to ten years and the future full-time wages was statistically insignificant.

In Table 6 (Model 8) skill levels of occupation were examined, both in part-time and full-time employment. The results demonstrate that there were no statistically significant differences between part-time and full-time work experience in high-skilled occupations. At the same time, the coefficients of the variable representing a past medium-skilled part-time worker were negative (−4.2% for the experience from two to five years before the start of full-time employment, and −4.1% for the experience from six to ten years before the start of full-time employment) and significant at the 0.05 and 0.01 levels, respectively. A coefficient for low-skilled part-time work experience has a negative sign and is of a greater magnitude (−9.0%) than the other coefficients, and is highly significant. However, this correlation after five years became statistically insignificant. When comparing the occupational skill groups in full-time and part-time employment, it should be pointed out that the inverse relationship between working in medium- or low-skilled occupations and the future wages was stronger for part-time employees. Therefore, reduced work experience both in terms of working fewer hours and working below one's qualifications might negatively affect future wages.

The analysis presented above demonstrates that the inverse relationship between part-time work experience and the future full-time wages, hinted at in the previous part of this paper, is robust to different specifications of the model, which supports the H1 hypothesis. The results of Model 8 suggest that that link applies to part-time work in medium- and low-skilled occupations. The results for part-time work experience after five years from entering full-time employment differ between specifications, which leads to the conclusion that there is insufficient evidence to support the H2 hypothesis.

5. Discussion

The relationship between part-time work experience and lower future wages in full-time employment (up to five years after switching to full-time employment) presented in this study is in line with previous empirical research on the effects of part-time employment on future wages (Blundell et al., 2016; Connolly & Gregory, 2009;

Paul, 2016; one has to remember, though, that these studies concern solely female employees).

This paper also shows, through analysing part-time work experience across different occupational groups, that both working fewer hours and working below one's qualifications can be a reason for the negative impact of part-time work on future wages. Similar conclusions were presented by Connolly and Gregory (2009) with regard to women in the UK.

While part-time work experience leads to lower future earnings as compared to salaries earned by employees having solely full-time work experience, the decrease in the hourly wage resulting from former part-time employment is smaller than the decrease resulting from former non-employment. Paul (2016) finds a similar relationship for German women. Blundell et al. (2016) observed a related pattern for women from the UK, namely that part-time employment reduces the depreciation of skills resulting from non-employment.

Concerning the possible limitations of this study, it must be mentioned that the fixed effects 'within' estimator assumes time-invariant unobserved heterogeneity, and therefore some unobserved characteristics of individuals which change over time (e.g. mid-career educational enhancements) may not be taken into consideration. Another issue that might limit the possibility of drawing unambiguous conclusions as to the causal effects is the problem of selection into part-time employment, which might be affected by a number of factors, including changes in legislation. Finally, reasons for switching to part-time work differ across employees, which might also have heterogeneous effects on future wages. Therefore, the results presented in this study should be approached with caution in terms of causality.

6. Conclusions

The aim of this study was to address a substantial research gap in the assessment of the relationship between temporary part-time employment and the subsequent wages in full-time employment of male workers (within five and ten years from the date of switching to full-time employment), and so to contribute to literature devoted to this matter. To account for unobserved time-invariant characteristics of employees, the fixed effects 'within' estimator was employed. Data from the German SOEP covering the years 1984–2014 were used in the analysis.

The results indicate that part-time work experience is associated with lower future wages (when compared to full-time work experience) within five years after switching to full-time employment. A one-year increase in the number of years in part-time work in the last two to five years decreases full-time job wages on average by

4.4%. Therefore, the first research hypothesis, that previous temporary part-time work experience is associated with lower wages after the first year of being employed full-time, when compared to full-time work experience, cannot be rejected. However, the link between the former experience of temporary part-time work and future wages was statistically insignificant after five years of having worked full-time, which suggests that the second research hypothesis, which says that this link would be statistically significant, should be rejected. Further analyses show that the results were driven mainly by the observations after the year 2001 and that an inverse relationship between previous part-time employment and future full-time job wages was observable among former workers of part-time low- and medium-skilled jobs. The results were robust when testing both full-time and part-time workers, controlling for teachers and examining the actual worked hours.

The increasing scale of part-time employment among men in the EU leads to the question of the long-term economic effects of working less than regular hours. An empirical analysis in this study shows that former part-time employees earn considerably less after switching to full-time employment. However, this inverse relationship is no longer significant after five years from having started working full-time. Non-employment seems to be substantially more detrimental than working fewer than regular hours in terms of the subsequent full-time wages. These results indicate the need for further research in the field of part-time employment among men, especially in other EU countries, with the application of methods that would make it possible to draw unambiguous causal inferences.

Acknowledgements

I would like to especially thank Bernd Fitzenberger, Jakob de Lazzar and the participants of 'Econometric Projects' seminar at the Humboldt University of Berlin in the Winter Semester of 2016/2017 for their insightful comments and suggestions. Should any errors be detected in this paper, I am the only person responsible for them.

References

- Biewen, M., Fitzenberger, B., de Lazzar, J. (2018). The role of employment interruptions and part-time work for the rise in wage inequality. *IZA Journal of Labor Economics*, 7(1), 1–34. <https://doi.org/10.1186/s40172-018-0070-y>
- Blundell, R., Dias, M. C., Meghir, C., Shaw, J. (2016). Female Labor Supply, Human Capital, and Welfare Reform. *Econometrica*, 84(5), 1705–1753. <https://doi.org/10.3982/ECTA11576>
- Bollé, P. (1997). Part-time work: Solution or trap?. *International Labour Review*, 136(4), 557–579. <https://www.ilo.org/public/english/revue/articles/97-4.htm>

- Breusch, T. S., Pagan, A. R. (1980). The Lagrange Multiplier Test and its Applications to Model Specification in Econometrics. *The Review of Economic Studies*, 47(1), 239–253. <https://www.jstor.org/stable/2297111>
- Buddelmeyer, H., Mourre, G., Ward-Warmedinger, M. (2005). *Part-Time Work in EU Countries – Labour Market Mobility, Entry and Exit* (ECB Working Paper No. 460). <https://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp460.pdf>
- Connolly, S., Gregory, M. (2008). Moving down: women's part-time work and occupational change in Britain 1991–2001. *The Economic Journal*, 118(526), 52–76. <https://doi.org/10.1111/j.1468-0297.2007.02116.x>
- Connolly, S., Gregory, M. (2009). The Part-time Pay penalty: Earnings Trajectories of British Women. *Oxford Economic Papers*, 61, 76–97. <https://doi.org/10.1093/oep/gpn043>
- Farber, H. S. (1999). Alternative and Part-Time Employment Arrangements as a Response to Job Loss. *Journal of Labour Economics*, 17(S4), 142–169. <https://doi.org/10.1086/209946>
- Fitzenberger, B., Steffes, S., Strittmatter, A. (2016). Return-to-job during and after parental leave. *The International Journal of Human Resource Management*, 27(8), 803–831. <https://doi.org/10.1080/09585192.2015.1037328>
- Hausman, J. A. (1978). Specification Tests in Econometrics. *Econometrica*, 46(6), 1251–1271. <https://www.jstor.org/stable/1913827>
- Hirsch, B. T. (2005). Why Do Part-Time Workers Earn Less? The Role of Worker and Job Skills. *ILR Review*, 58(4), 525–551. <https://doi.org/10.1177/001979390505800401>
- Kyyrä, T., Arranz, J. M., García-Serrano, C. (2017). *Does Part-Time Work Help Unemployed Workers to Find Full-Time Work?. Evidence from Spain* (IZA Working Papers No. 10770). <http://ftp.iza.org/dp10770.pdf>
- Manning, A., Petrongolo, B. (2008). The part-time penalty for women in Britain. *The Economic Journal*, 118(526), 28–51. <https://doi.org/10.1111/j.1468-0297.2007.02115.x>
- Månsson, J., Ottosson, J. (2011). Transitions from part-time unemployment: Is part-time work a dead end or a stepping stone to the labour market?. *Economic and Industrial Democracy*, 32(4), 569–589. <https://doi.org/10.1177/0143831X10387836>
- Nelen, A., de Grip, A. (2009). Why Do Part-time Workers Invest Less in Human Capital than Full-timers?. *Labour*, 23(s1), 61–83. <https://doi.org/10.1111/j.1467-9914.2008.00439.x>
- OECD. (2012). *Settling In: OECD Indicators of Immigrant Integration 2012*. Paris: OECD Publishing. <https://doi.org/10.1787/9789264171534-en>
- OECD. (2016). *OECD Labour Force Statistics 2015*. Paris: OECD Publishing. https://doi.org/10.1787/oecd_lfs-2015-en
- OECD. (2019). *OECD Employment Outlook 2019: The Future of Work*. Paris: OECD Publishing. <https://doi.org/10.1787/9ee00155-en>
- Paul, M. (2016). Is There a Causal Effect of Working Part-Time on Current and Future Wages?. *The Scandinavian Journal of Economics*, 118(3), 494–523. <https://doi.org/10.1111/sjoe.12157>
- Tam, M. (1997). *Part-Time Employment: A Bridge or a Trap?*. Aldershot: Avebury.
- Wagner, G. G., Frick, J. R., Schupp, J. (2007). The German Socio-Economic Panel Study (SOEP) – Scope, Evolution and Enhancements. *Schmollers Jahrbuch: Journal of Applied Social Science Stu-*

dies/Zeitschrift für Wirtschafts- und Sozialwissenschaften, 127(1), 139–169. <http://dx.doi.org/10.2139/ssrn.1028709>

Wooldridge, J. M. (2002). *Econometric Analysis of Cross Section and Panel Data*. Cambridge,

Appendix

Table A1. Past employment states and future wages, dependent variable: log of real hourly wages, detailed results

Specification	Model (years)			
	1 (1994–2014)	2 (1994–2001)	3 (2002–2014)	4 (1990–2014)
PT_{t-1}	-0.104*** (0.03)	-0.071* (0.04)	-0.107** (0.05)	-0.106*** (0.03)
$\sum_{s=2}^5 PT_{t-s}$	-0.044** (0.02)	-0.023 (0.02)	-0.031* (0.02)	-0.043*** (0.01)
$\sum_{s=6}^{10} PT_{t-s}$	-0.018 (0.01)	0.001 (0.02)	-0.012 (0.01)	.
NE_{t-1}	-0.115*** (0.02)	-0.103*** (0.02)	-0.114*** (0.02)	-0.109*** (0.01)
$\sum_{s=2}^5 NE_{t-s}$	-0.053*** (0.01)	-0.078*** (0.01)	-0.034*** (0.01)	-0.082*** (0.01)
$\sum_{s=6}^{10} NE_{t-s}$	-0.025*** (0.00)	-0.028*** (0.01)	-0.016*** (0.01)	.
Age: 18–23 .....	.	.	.	-0.292*** (0.02)
24–29	-0.074*** (0.01)	-0.048*** (0.01)	-0.065*** (0.02)	-0.080*** (0.01)
35–39	0.042*** (0.01)	0.020** (0.01)	0.046*** (0.01)	0.042*** (0.01)
40–44	0.067*** (0.01)	0.035** (0.01)	0.071*** (0.02)	0.054*** (0.01)
45–49	0.070*** (0.01)	0.040** (0.02)	0.077*** (0.02)	0.042*** (0.01)
50–58	0.054*** (0.01)	0.035* (0.02)	0.062*** (0.02)	0.011 (0.01)
30–34	ref.	ref.	ref.	ref.
East Germany	0.075 (0.07)	0.146** (0.06)	-0.026 (0.04)	0.006 (0.05)
Rural area	0.014 (0.03)	0.002 (0.02)	0.047* (0.03)	0.013 (0.02)
Year dummies	yes	yes	yes	yes
Intercept	2.879*** (0.02)	2.935*** (0.02)	2.842*** (0.02)	2.921*** (0.02)
N	20,332	6,936	13,396	43,543
R-squared within	0.115	0.112	0.050	0.217
R-squared between	0.023	0.060	0.115	0.211
Rho	0.905	0.880	0.918	0.872
σ_u	0.396	0.298	0.417	0.405
σ_e	0.128	0.110	0.125	0.155

Note. Clustered standard errors are reported in parentheses. Asterisks denote significance levels: *** – 0.01, ** – 0.05, * – 0.1. ref. – reference group. *PT* – part-time employment, *NE* – non-employment. Observations consist of current full-time employees.

Source: author's work supported by Stata 15 (xtreg package) and data from SOEP.

Table A2. Past employment states and future wages, dependent variable:
log of real hourly wages, part-time employees included, detailed results

Specification	Model 5 (years 1994–2014)	Specification	Model 5 (years 1994–2014)	Specification	Model 5 (years 1994–2014)
<i>PT</i>	0.315*** (0.05)	<i>Age: 18–23</i> .....	.	<i>Rural area</i>	0.025 (0.03)
<i>PT</i> _{<i>t</i>-1}	-0.172*** (0.03)	24–29	-0.074*** (0.01)	<i>Year dummies</i>	yes
$\sum_{s=2}^5 PT_{t-s}$	-0.029* (0.01)	35–39	0.042*** (0.01)	<i>Intercept</i>	2.877*** (0.02)
$\sum_{s=6}^{10} PT_{t-s}$	-0.014* (0.01)	40–44	0.069*** (0.01)	<i>N</i>	20,701
<i>NE</i> _{<i>t</i>-1}	-0.121*** (0.02)	45–49	0.071*** (0.01)	<i>R-squared within</i>	0.132
$\sum_{s=2}^5 NE_{t-s}$	-0.054*** (0.01)	50–58	0.056*** (0.01)	<i>R-squared between</i>	0.021
$\sum_{s=6}^{10} NE_{t-s}$	-0.022*** (0.00)	30–34	ref.	<i>Rho</i>	0.902
		<i>East Germany</i>	0.071 (0.07)	σ_u	0.404
				σ_e	0.133

Note. Clustered standard errors are reported in parentheses. Asterisks denote significance levels: *** – 0.01, ** – 0.05, * – 0.1. *PT* – part-time employment, *NE* – non-employment. Observations consist of current full-time and part-time employees.

Source: author's work supported by Stata 15 (xtreg package) and data from SOEP.

Table A3. Past employment states and future wages, dependent variable:
log of real hourly wages, teacher dummies, detailed results

Specification	Model 6 (years 1994–2014)	Specification	Model 6 (years 1994–2014)	Specification	Model 6 (years 1994–2014)
<i>PT</i> _{<i>t</i>-1}	-0.108*** (0.04)	<i>Age: 35–39</i>	0.042*** (0.01)	<i>Teacher PT</i> _{<i>t</i>-1}	0.031 (0.05)
$\sum_{s=2}^5 PT_{t-s}$	-0.046** (0.02)	40–44	0.067*** (0.01)	<i>Teacher</i> $\sum_{s=6}^{10} PT_{t-s}$	0.016 (0.02)
$\sum_{s=6}^{10} PT_{t-s}$	-0.019 (0.01)	45–49	0.069*** (0.01)	<i>Year dummies</i>	0.005
<i>NE</i> _{<i>t</i>-1}	-0.115*** (0.02)	50–58	0.054*** (0.01)	<i>Intercept</i>	yes 2.879*** (0.02)
$\sum_{s=2}^5 NE_{t-s}$	-0.053*** (0.01)	30–34	ref.	<i>N</i>	20,332
$\sum_{s=6}^{10} NE_{t-s}$	-0.025*** (0.00)	<i>East Germany</i>	0.076 (0.07)	<i>R-squared within</i>	0.115
<i>Age: 18–23</i>	–	<i>Rural area</i>	0.015 (0.03)	<i>R-squared between</i>	0.022
24–29	-0.074*** (0.01)	<i>Teacher</i>	-0.031 (0.04)	<i>Rho</i>	0.905
				σ_u	0.396
				σ_e	0.128

Note. As in Table A1.

Source: author's work supported by Stata 15 (xtreg package) and data from SOEP.

Table A4. Past employment states and future wages, dependent variable: log of real hourly wages, actual worked hours, detailed results

Specification	Model 7 (years 1994–2014)	Specification	Model 7 (years 1994–2014)	Specification	Model 7 (years 1994–2014)
PT_{t-1}	-0.068** (0.03)	<i>Age: 18–23</i>	x	<i>East Germany</i>	0.055 (0.06)
$\sum_{s=2}^5 PT_{t-s}$	-0.040** (0.02)	24–29	-0.066*** (0.01)	<i>Rural area</i>	0.031 (0.03)
$\sum_{s=6}^{10} PT_{t-s}$	-0.001 (0.01)	35–39	0.038*** (0.01)	<i>Year dummies</i>	yes
NE_{t-1}	-0.113*** (0.02)	40–44	0.054*** (0.01)	<i>Intercept</i>	2.815*** (0.02)
$\sum_{s=2}^5 NE_{t-s}$	-0.051*** (0.01)	45–49	0.054*** (0.01)	N	20,341
$\sum_{s=6}^{10} NE_{t-s}$	-0.024*** (0.00)	50–58	0.040*** (0.01)	<i>R-squared within</i> ...	0.092
		30–34	ref.	<i>R-squared between</i>	0.023
				Rho	0.886
				σ_u	0.381
				σ_e	0.137

Note. As in Table A1.

Source: author’s work supported by Stata 15 (xtreg package) and data from SOEP.

Table A5. Past employment states and future wages, dependent variable: log of real hourly wages, occupational levels, detailed results

Specification	Model 8 (years 1994–2014)	Specification	Model 8 (years 1994–2014)	Specification	Model 8 (years 1994–2014)
<i>FThigh</i>	ref.	$\sum_{s=6}^{10} PThigh_{t-s}$	0.002 (0.01)	<i>Age: 45–49</i>	0.069*** (0.01)
<i>FTmedium</i>	-0.016** (0.01)	$PTmedium_{t-1}$	-0.199*** (0.04)	50–58	0.054*** (0.01)
<i>FTlow</i>	-0.031*** (0.01)	$\sum_{s=2}^5 PTmedium_{t-s}$	-0.042** (0.02)	30–34	ref.
$FTmedium_{t-1}$	-0.017** (0.01)	$\sum_{s=6}^{10} PTmedium_{t-s}$	-0.041*** (0.01)	<i>East Germany</i>	0.076 (0.07)
$\sum_{s=2}^5 FTmedium_{t-s}$	-0.014*** (0.00)	$PTlow_{t-1}$	-0.142* (0.08)	<i>Rural area</i>	0.015 (0.03)
$\sum_{s=6}^{10} FTmedium_{t-s}$	-0.010*** (0.00)	$\sum_{s=2}^5 PTlow_{t-s}$	-0.090*** (0.03)	<i>Teacher</i>	-0.031 (0.04)
$FTlow_{t-1}$	-0.019* (0.01)	$\sum_{s=6}^{10} PTlow_{t-s}$	-0.020 (0.03)	<i>Teacher</i> PT_{t-1}	0.031 (0.05)
$\sum_{s=2}^5 FTlow_{t-s}$	-0.026*** (0.01)	NE_{t-1}	-0.135*** (0.02)	<i>Teacher</i> $\sum_{s=2}^5 PT_{t-s}$	0.016 (0.02)
$\sum_{s=6}^{10} FTlow_{t-s}$	-0.016*** (0.00)	$\sum_{s=2}^5 NE_{t-s}$	-0.064*** (0.01)	<i>Teacher</i> $\sum_{s=6}^{10} PT_{t-s}$	0.005 (0.02)
<i>PThigh</i>	0.309*** (0.05)	$\sum_{s=6}^{10} NE_{t-s}$	-0.028*** (0.00)	<i>Year dummies</i>	yes
<i>PTmedium</i>	0.318*** (0.10)	<i>Age: 18–23</i>	x	<i>Intercept</i>	2.966***
<i>PTlow</i>	0.319*** (0.09)	24–29	-0.074*** (0.01)	N	20,701
$PThigh_{t-1}$	-0.164*** (0.03)	35–39	0.042*** (0.01)	<i>R-squared within</i> ...	0.145
$\sum_{s=2}^5 PThigh_{t-s}$	-0.012 (0.02)	40–44	0.067*** (0.01)	<i>R-squared between</i>	0.168
				Rho	0.890
				σ_u	0.376
				σ_e	0.132

Note. As in Table A2. *FT* – full-time employment.

Source: author’s work supported by Stata 15 (xtreg package) and data from SOEP.