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Article

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Economics and Business Letters

Provided in Cooperation with:
University of Oviedo

Reference: Dvouletý, Ondřej (2023). Underemployment and overemployment in Central Europe. In: Economics and Business Letters 12 (2), S. 147 - 156. https://reunido.uniovi.es/index.php/EBL/article/download/19261/15787/60069. doi:10.17811/ebl.12.2.2023.147-156.

Economics and Business Letters
12(2), 147-156, 2023

Underemployment and overemployment in Central Europe

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Received: 20 December 2022
Revised: 11 January 2023
Accepted: 22 January 2023

Abstract

This research examines the working hours preferences of the employees in selected Central European countries, specifically in the Czech Republic, Hungary and Poland. Using the country-representative data from the 2017 edition of the European Union Labour Force Survey (EU LFS), the study investigates the discrepancies between respondents' desired working hours and those usually worked per week. A comparative econometric analysis of those individuals who work more than they wish (overemployed) and those who work less than they desire (underemployed) is conducted. Several interesting observations came out of the performed analysis. We document some significant variables shaping these two situations occurring in the Central European labour markets. The obtained findings document the heterogeneity concerning gender, education, migration background, experience and occupation. Still, our main conclusion is that most of the employees do not face working hours discrepancies. However, other relevant observations occur as well, such as the role of experience, indicating that individuals with fewer years of experience are more likely to work fewer hours than desired. For those working more than wished, we observe an inverted u-shaped pattern.

Keywords: underemployment, overemployment, job, working hours
JEL Classification Codes: J21, J22

1. Introduction

The neoclassical economic theory of labour supply assumes (Reynolds and Aletraris, 2006; 2010; Campbell and van Wanrooy, 2013; Kaufman, 2016; Paz, 2022) that the working hours reflect the individual preferences of employees to work their self-determined time. The labour market equilibrium is reached through price adjustments (i.e., wages and salaries). Despite these theoretical assumptions, empirical researchers with a background from various disciplines (Zimmer and Weber, 2021; Lamolla et al., 2021; Otterbach et al., 2021) observe differences between the preferred/desired working hours and the actual time the employees spend at work. The earlier research divided the mismatch in working hours into two main phenomena. Compared to the ideal state when the employee performs the desired working hours, affiliated with the term working hours congruence (Lee et al., 2015), the situation when individuals work fewer working hours than they wish is called underemployment or underworking. The opposite

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Citation: Dvouletý, O. (2023) Underemployment and overemployment in Central Europe, *Economics and Business Letters*, 12(2), 147-156.

DOI: 10.17811/ebl.12.2.2023.147-156

case, i.e., when employees work more than they want to, is linked with the terms overworking or overemployment (Campbell and van Wanrooy, 2013; Steiber and Hass, 2018; Mohammed et al., 2021; Girtz, 2021; Ziesemer and Gässler, 2021).

The previous research studies trying to understand better the imbalance and discrepancies in workers' desired working hours have attempted to capture both reasons and circumstances of these mismatches. For example, Reynolds and Aletraris (2006; 2010) explain that individual preferences for working hours develop over the life cycle, being impacted by both job- and occupation-related factors, but also by family, its composition, structure and household characteristics. Campbell and van Wanrooy (2013) add that employees continuously evaluate their desired working hours depending on the life events they experience, which explains the possible shifts in the prior stated preferences. Furthermore, according to Otterbach et al. (2021), institutional and organizational settings also play a significant role, and the authors highlight the aspect of the regulatory framework particularly.

Notably, wider stakeholders, including policymakers, are interested in the research on working hours discrepancies due to the effects of working hours mismatches on individual careers, income, satisfaction and income (Bartoll and Ramos, 2020; Lamolla et al., 2021). A recent study by Otterbach et al. (2021) concludes that overemployment is associated with lower levels of mental health. Even other studies (Wooden et al., 2009; Angrave and Charlwood, 2015; Bell and Blanchflower, 2019) document a negative impact of overworking on subjective well-being. On the other hand, underemployment is deemed to be linked with missed opportunities of exploiting the full potential of individuals' skills and capabilities, lower personal earnings, self-esteem and work-related satisfaction (Wilkins, 2007; George et al., 2012; Roh et al., 2014). These acknowledged individual- and family-related effects shape the overall labour markets, affected by the relative proportions of employees whose working hours are mismatched (Golden, 2009; Tam, 2010).

Given the ongoing development of labour markets, experiencing skill-biased technological changes (Murphy and Topel, 2016), changes in institutions (Holman and Rafferty, 2018), and global events such as wars or pandemics (Zinecker et al., 2021), it is relevant to revisit the earlier research findings on workings hours mismatches. The scholarly debate may be enriched by evidence from countries and contexts that have not been studied before, which is the intended contribution of this study. The article aims to provide findings on the discrepancies between respondents' desired working hours and those usually worked per week from the perspective of the selected Central European countries, namely, the Czech Republic, Hungary and Poland. The motivation for this endeavour lies in the lack of region-focused works addressing the issue but also in the observations of scholars (True, 1999; Hobson and Fahlén, 2009; Flek and Mysíková, 2015; Novák et al., 2016; Green and Henseke, 2021) noting that particularly post-communist countries in Central Europe have higher shares of overemployed and underemployed workers.

Therefore, the study explores the country-representative data from the 2017 edition of the European Union Labour Force Survey (EU LFS) and provides findings from the conducted multivariate probit regression estimates, comparing characteristics and factors between employees' working hours match and those who are overemployed and underemployed.

The study's contribution is to better understand the overemployed and underemployed workers in Central Europe and address the regional research gap. In brief, the article seeks to answer the main research question, asking what variables shape these working hours mismatches in the Central European labour markets. The next section introduces our EU LFS dataset (N=45,109), the utilized variables and their summary statistics. The probit econometric analysis is conducted in the following part of the article, and the results, together with future research recommendations, are discussed in the final section.

2. Data and variables

Campbell and van Wanrooy (2013) have critically discussed the empirical challenges of studying working hours discrepancies. The authors note that the researchers can benefit from analyzing extensive large-scale surveys due to the availability of working-time preferences data, helping to observe the subjective assessment of working-time gaps broadly, although this approach is not wholly without limitations. We took this recommendation into account and explored the data from the population-representative European Union Labour Force Survey (EU LFS), which contains the relevant variables, including sufficient information about working hours and occupational preferences, meeting thus the objective of our research. We extract from the EU LFS 2017 dataset (for survey details, see documents provided by Eurostat, 2018; 2019; 2020) samples of the studied Central European economies, i.e., the Czech Republic, Hungary and Poland, and restrict the data only to full-time employees, for the sake of the straightforwardness of the conducted analysis. Once determining the sample further to the non-missing variables, the final selection includes information about 45,109 employees. The sample consists of 12,536 individuals working in the Czech labour market, 16,319 in the Hungarian labour market and 16,254 in the Polish labour market.

We begin by exploring the data on working hours preferences. EU LFS (Eurostat, 2019) contains information about the desired working hours per week (*hwwish*) and the number of hours per week respondents usually worked in the main job (*hwusual*). By deducing these two variables from each other (Zimmert and Weber, 2021), we obtain the working hours' discrepancy variable, helping us to determine the proportions of underemployed and overemployed respondents. Descriptive statistics in Table 1 inform the readers that the share of overemployed is higher (7.3%) than those underemployed (6.4%), with an average discrepancy of 4.3 hours per week. It also follows from these statistics that most full-time employees in studied countries belong to the category of workers with no mismatches in working hours. The summary statistics further revealed two respondents working 6 hours per week and two working 10 hours per week, which we decided to exclude from the multivariate analysis as outliers.

The dataset also contains a wide range of variables, including information concerning the *age* and *gender* of the respondent (being a female =1), *country of origin* (being born outside of the country of residence =1), the highest *level of education* obtained (according to International Standard Classification of Education, 2011), accumulated *years of experience*, *occupation type* (according to International Standard Classification of Occupations – ISCO; International Labour Organization, 2008), employer industry classification (according to NACE-2 Rev standards.), *number of children*, and information whether *the partner/spouse lives in the same household* as the respondent (=1 if yes). The selection of these variables and characteristics was inspired by the previous studies (Reynolds and Aletraris, 2010; Steiber and Haas, 2018; Otterbach et al., 2021; Zimmert and Weber, 2021) and the EU LFS data availability, with the aim to include in the empirical analysis job-related characteristics, individual-level factors, as well as family situation and presence of children in the household.

3. Empirical analysis

Inspired by the previous studies (Reynolds and Aletraris, 2010; Steiber and Haas, 2018; Otterbach et al., 2021), we divide our sample of employees working in Central European countries into 1) individuals with *no discrepancies in working hours*, 2) those who are *underemployed* and 3) those who are *overemployed*. We conduct a comparative two separate multivariate analyses, where the first group serves as a relative/reference to the two latter. Methodologically, we rely on estimating the econometric probit regression models with the dependent variables representing underemployment or overemployment, respectively. This particular strategy was selected in line with the prior literature, assuming different profiles and

Table 1. Sample descriptive statistics (Employees only, 15-64 years).

Variable	Frequency (%)	N
Underemployed (=1)	6.4	42,528
Overemployed (=1)	7.3	42,446
15-19 years of age (=1)	0.3	45,109
20-24 years of age (=1)	6.1	45,109
25-29 years of age (=1)	12.7	45,109
30-34 years of age (=1)	14.1	45,109
35-39 years of age (=1)	14.7	45,109
40-44 years of age (=1)	14.8	45,109
45-49 years of age (=1)	12.0	45,109
50-54 years of age (=1)	11.1	45,109
55-59 years of age (=1)	9.6	45,109
60-64 years of age (=1)	4.6	45,109
Female (=1)	47.1	45,109
Nationality non-Native (=1)	0.1	45,109
Less than Primary Education (=1)	0.0	45,109
Primary Education (=1)	0.3	45,109
Lower Secondary Education (=1)	4.8	45,109
Upper Secondary Education (=1)	57.4	45,109
Post-secondary Non-tertiary Education (=1)	4.0	45,109
Short-cycle Tertiary Education (=1)	0.4	45,109
Bachelor's or Equivalent Level (=1)	9.2	45,109
Master's or Equivalent Level (=1)	23.1	45,109
Doctoral or Equivalent Level (=1)	0.8	45,109
Elementary Occupations (=1)	7.0	45,109
Skilled agricultural, forestry and fishery workers (=1)	0.6	45,109
Service and sales workers (=1)	12.8	45,109
Plant and machine operators and assemblers (=1)	13.9	45,109
Craft and related trades workers (=1)	16.0	45,109
Clerical support workers (=1)	8.2	45,109
Technicians and associate professionals (=1)	16.1	45,109
Professionals (=1)	19.8	45,109
Managers (=1)	5.6	45,109
Partner/spouse living in the same household (=1)	69.4	45,109

Variable	Mean	SD	Min	Max	N
Desired working hours per week	40.6	4.4	1	98	45,109
Number of hours per week usually worked in the main job	40.6	3.8	6	80	45,109
Working hours discrepancy	-0.01	4.3	-59	58	45,109
Years of Experience	10.1	9.8	0	50	45,109

Note: Post-stratification weights applied.
Source: Own elaboration based on the Labour Force Survey (LFS) 2017 data (Eurostat, 2018).

motivations of those two groups (Lee et al., 2015; Mohammed et al., 2021; Rodríguez Hernández, 2021). Our models are estimated with the country weights reflecting the sizes of the workforces in each country and the reported standard errors are robust. Dummy variables reflecting the area of living, the respondent's country, and the employer's industry are also included in the estimated models. Table 2 presents the final estimates concerning variables impacting underemployment (Model I) and overemployment (Model II). Both estimated models were found to be statistically significant (Chi-square's p-value = 0.000), and the statistical significance of variables are interpreted based on the results of the z-tests.

Overall, there are several significant factors shaping underemployment (Model I). We observe that women are less likely to be underemployed. We further find a positive effect for those born in a different country and an increasing impact on the level of education obtained. A higher number of years of accumulated experience is negatively associated with underemployement. Furthermore, several occupations have a higher chance of underemployment, particularly those working as Plant and machine operators and assemblers, and Professionals. However, our analysis does not prove any role of family and children, nor the respondent's age.

When it comes to the determinants of overemployment (Model II), we also observe a significant and negative impact of being a female, as well as no significant effects of variables reflecting the respondents' age, family status or children. Similarly, even overemployment is positively related to higher levels of formal education. Years of experience were found to have a non-linear impact on overemployment, reflecting the inverted u-shape, with a maximum of about 14 years, showing that the positive effect diminishes after fourteen years of experience. Several occupations were also found to be more positively related to overemployment, specifically Service and sales workers, Plant and machine operators and assemblers, Professionals and Managers.

Table 2. Regression analysis of Underemployment and Overemployment.

Independent variables/ Dependent variables:	**(I.) Underemployed (=1)**	**(II.) Overemployed (=1)**
20-24 years of age	0.175	-0.0282
	(0.187)	(0.253)
25-29 years of age	0.138	-0.0585
	(0.184)	(0.250)
30-34 years of age	0.167	-0.0901
	(0.185)	(0.250)
35-39 years of age	0.0994	-0.0564
	(0.185)	(0.250)
40-44 years of age	0.178	-0.0462
	(0.185)	(0.250)
45-49 years of age	0.226	0.00948
	(0.186)	(0.250)
50-54 years of age	0.173	-0.0665
	(0.187)	(0.251)
55-59 years of age	0.100	0.0120
	(0.187)	(0.251)
60-64 years of age	-0.0836	-0.00935
	(0.193)	(0.253)
Female	-0.320***	-0.0977**
	(0.0298)	(0.0312)
Nationality non-Native	0.270+	0.0390
	(0.142)	(0.115)
Primary Education	3.026***	3.130***
	(0.312)	(0.360)
Lower Secondary Education	3.238***	3.114***
	(0.144)	(0.239)
Upper Secondary Education	3.227***	3.054***
	(0.137)	(0.232)
Post-secondary Non-tertiary Education	3.251***	3.006***
	(0.148)	(0.244)
Short-cycle Tertiary Education	3.093***	2.925***
	(0.214)	(0.323)
Bachelor's or Equivalent Level	3.141***	3.075***
	(0.145)	(0.240)

Table 2. Regression analysis of Underemployment and Overemployment. (cont'd).

Independent variables/ Dependent variables:	(I.) Underemployed (=1)	(II.) Overemployed (=1)
Master's or Equivalent Level	3.196***	3.069***
	(0.144)	(0.236)
Doctoral or Equivalent Level	3.419***	3.083***
	(0.189)	(0.264)
Years of Experience	-0.0122**	0.0176***
	(0.00451)	(0.00464)
Years of Experience Squared	0.000193	-0.000649***
	(0.000127)	(0.000132)
Skilled agricultural, forestry and fishery workers	0.118	0.126
	(0.166)	(0.150)
Service and sales workers	0.0613	0.201**
	(0.0622)	(0.0758)
Plant and machine operators and assemblers	0.124*	0.226**
	(0.0611)	(0.0731)
Craft and related trades workers	0.0716	0.112
	(0.0638)	(0.0744)
Clerical support workers	0.0493	-0.124
	(0.0701)	(0.0808)
Technicians and associate professionals	0.0293	0.0982
	(0.0633)	(0.0755)
Professionals	0.133+	0.206*
	(0.0692)	(0.0815)
Managers	0.0396	0.388***
	(0.0835)	(0.0856)
Partner/spouse living in the same household	-0.0165	0.0100
	(0.0320)	(0.0328)
Number of children in the household aged less than 15 years	0.00315	0.0257
	(0.0182)	(0.0182)
Constant	-5.141***	-4.355***
	(0.226)	(0.335)
Area of living dummies	Yes	Yes
Industry dummies (NACE-2 Rev)	Yes	Yes
Country dummies	Yes	Yes
Observations	42,519	42,446
Prob > chi2	0.00	0.00
Pseudo R^2	0.040	0.047
Akaike information criterion (AIC)	7309.7	8020.8
Bayesian information criterion (BIC)	7785.9	8488.2

Notes: Sample of the Czech, Polish and Hungarian employees only. Post-stratification weights were applied. Robust standard errors are in parentheses, statistical significance is reported as follows: + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. A turning point for *Experience* and *Experience Squared* in Model II.: 14 years.
Reference groups for dummy variables: *Age (15-19 years)*; *Male*; *Native of own Country; Less than Primary Education; Low-skilled Professions/Elementary Occupations, Partner/spouse does not live in the same household.*
Source: STATA 14, own calculations based on the Labour Force Survey (LFS) 2017 data (Eurostat, 2018).

4. Discussion and conclusions

This research addressed the issue of working hours discrepancies in selected Central European countries, specifically in the Czech Republic, Hungary and Poland. Building on the neoclassical labour market economics theoretical assumptions and previous empirical studies (Reynolds and Aletraris, 2010; Campbell and van Wanrooy, 2013; Lamolla et al., 2021), we provide evidence from the post-communist countries having higher shares of overemployed and underemployed workers (Green and Henseke, 2021). Studying factors and characteristics impacting employees

whose working hours are mismatched is relevant for the employees. However, also for employers and policymakers, as some recent studies identified the effects of these situations on earnings, self-esteem, satisfaction and well-being (Roh et al., 2014; Bell and Blanchflower, 2019; Otterbach et al., 2021).

We explored the data from the recent 2017 edition of the European Union Labour Force Survey. We performed an econometric analysis, comparing individuals whose working hours are mismatched with those who have no discrepancies in working hours. Surprisingly, underemployment and overemployment were less likely to occur among women. This is not entirely in line with the previous literature. A study by Reynolds (2004) observed a positive pattern only for underemployed women due to women's desire to balance family and household-related duties with their jobs. However, interpreted together with the insignificant effects of children and household-specific variables, it looks like in the studied Central European countries, the phenomenon seems to be more complex. These linkages could be explored more with the qualitative research approach, for example, through semi-structured interviews or focus groups, providing insights into career development desires and looking beyond statistical patterns (Campbell and van Wanrooy, 2013; Lamolla et al., 2021). Another future research recommendation would be to study couples together and see how they cope with household and family duties and mutually determine their working hours (Steiber and Haas, 2018).

In both studied situations, we observed positive effects of education level variables. The role of education attainment differed across the previous studies. While our results are similar to those obtained recently by Zimmert and Weber (2021), Steiber and Haas (2018) found no effects on overemployment and negative impact on underemployment and no conclusive results were reported by Reynolds and Aletraris (2010). Future research should thus provide more insights into the role of formal education. However, accumulated experience results are relatively straightforward, indicating that individuals with fewer years of experience, gaining their professional knowledge and skills, are more likely to be underemployed (Reynolds, 2004; Golden and Altman, 2008). The overemployment seems to be then associated with experience by the inverted u-shaped pattern, known well in labour economics (Tam, 2010; Fernandez and Shiang, 2017; De Moortel et al., 2018), documenting that individuals start to prefer fewer working hours at particular career stage. Surprisingly, not many studies have attempted to quantify the turning point, calculated in our regression model to be 14 years.

The conducted analysis also documents the heterogeneity of professions, indicating that some professions are more likely to be linked with working hours discrepancies. In line with the previous studies (Golden and Altman, 2008, Reynolds and Aletraris, 2010; Zimmert and Weber, 2021), we find that highly skilled occupations, especially managers and professionals, are more likely to be associated with overemployment. We also point out the several professions being more linked with underemployment, such as plant and machine operators and assemblers. Lastly, we would like to highlight that migration background was positively associated with underemployment which can reflect the challenges related to the adaption of different nationalities on the local markets or employers' willingness to employ them sufficiently.

These findings, put together, contribute to the regional knowledge of the mismatches of working hours. According to the best author's knowledge, such a study has not been conducted yet, and thus it can be considered as unique from the perspective of the Central European labour market. Furthermore, some of the provided findings represent added value for international scholarship, despite the limitations faced. These are particularly linked with the EU LFS survey design and usage of only one particular year of survey data (Campbell and van Wanrooy, 2013), not allowing for tracking working hours preferences over time and providing longitudinal evidence. The longitudinal datasets could also be explored by alternative methodological approaches, especially by estimating the multinomial logistic regressions, and tracking over time whether respondents mitigate the discrepancies or not (Zimmert and Weber, 2021; Wanger and

Zapf, 2022). Future research could also more carefully study the role of family and household characteristics in the selected occupations or industries or among those individuals who do not work full-time but only part-time.

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