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ANALYSIS OF RECENT TRENDS IN GENDER PAY GAPS IN THE CZECH AND SLOVAK REPUBLICS USING SURVEY DATA

Abstract:

This paper examines the evolution of gender pay gaps in Czechia and Slovakia using microdata from five waves of the Structure of Earnings Survey conducted between 2002 and 2018. We estimate pay gaps for subsamples categorized by age, occupational groups, and employer sector classification. Our findings indicate that gender pay gaps are broadly similar in both countries, likely due to their shared cultural and institutional heritage. Moreover, pay gaps are gradually decreasing over the studied period in both countries. The most pronounced wage differentials are observed among individuals aged 30 to 49 years, a period often associated with significant child-rearing responsibilities for women. The largest pay gaps are found in medium-skilled blue-collar occupations. Sectorally, the highest pay gaps, often exceeding 20%, are observed in mining, industry, information and communication, and financial services, whereas the lowest gaps, falling below 10%, are found in education, arts, entertainment, and recreation.

Keywords:

Gender pay gap, Economic inequality, Czech Republic, Slovakia, Labour market, Wage trends

JEL Classification: J16, J31, O50

1 Introduction

Wage inequality has been a persistent issue in society for several years. Historically, this problem received little emphasis due to prevailing social and political norms. However, in recent years, there has been a growing public sensitivity to issues of equality, including equal opportunity, access to education and healthcare, and fair pay.

According to OECD statistics, the proportion of working women has nearly tripled in some developed countries over the last century. This increase has contributed to the equalization of social status between genders, enhancing women's economic independence and financial literacy. Despite these advances, gender pay inequalities persist. Eurostat estimates the wage gap for 2022 at 12.7% across the EU, with Slovakia at 17.7% and Czechia at 17.9%. Key factors influencing this gap include occupational choice, motherhood, personal characteristics, labor market structure (Harman, 2023), and social norms (Goldin, 2014).

Some argue that the wage gap results from women's choices in education, career, and lifestyle, leading to lower wages. Although the gap has narrowed as women have achieved higher education and increased labor market participation, research suggests that women's choices are influenced by cultural norms, structures, and attitudes, not merely personal preferences. Cultural and social influences may lead women to underestimate their competencies and select lower-paying jobs, even when educational factors are considered (Reilly et al., 2022).

Numerous studies have documented that one of the most significant factors explaining gender pay gaps (GPG) is motherhood. According to OECD data (2023), women with children earn less on average than women without children and men, regardless of parental status. Raising children typically involves significant unpaid labour in the form of household work. Working women spend an average of 22 hours per week on these activities, compared to 9 hours for working men. This disparity is reflected in the labor market: while only 1 in 10 men reduce their work hours for family reasons, up to 1 in 3 women do so (OECD, 2023). Women are also more likely to take career breaks for parental leave, which negatively impacts both their wages and future participation rate.

Another perspective on GPG emphasizes the role of voluntary occupational choices rather than discrimination. Occupational differences are thus a further potentially significant factor, with about half the pay gap in the United States is attributable to job types (Blau and Kahn, 2016). For comparison, the European Commission reports that 24% of the pay gap is due to women's over-representation in low-paid sectors such as care, health, and education, known as sectoral segregation.

This paper analyzes gender pay gaps in Czechia and Slovakia, offering subsample estimates across various age groups, occupational categories, and employer sectors. This approach enables a comparison of pay gaps among middle-aged groups, typically associated with motherhood, against those in younger and older age categories. Additionally, we investigate occupational and sectoral segregation. Given the shared cultural and institutional backgrounds of the two countries, we expect to find similar GPG. Finally, we examine the evolution of these gaps over time to determine if there is evidence of a narrowing trend. The main contribution of the paper is the comparison of the two countries using five waves of the Structure of Earnings Survey (SES) conducted between years 2002 to 2018. Compared to EU-SILC data, which is the most frequent choice in other studies, the data applied in this paper contains more detailed information on the firm employing the individuals and thereby our paper adds new estimates to the existing literature.

2 Literature Review

GPG being one of the most popular topics in labour economics, the empirical literature is extensive and estimates are available for a vast number of countries. Hence, in this review, we will focus on studies that use Czech or Slovak data. As regards Czechia, the literature is relatively rich. One of the most recent articles on the topic, Zajíčková and Zajíček (2021), use EU-SILC data from 2006 to 2017 and find that GPG remained relatively stable over time, with minimal influence from the business cycle. Parenthood is found to significantly increase the GPG, however women are able to reduce the gap by age 50. The authors find little impact of other demographic factors. Finally, the GPG is most pronounced at the lowest and highest earnings levels, according to estimates of the above paper.

As outlined by Zajíčková and Zajíček (2021), eleven studies have analyzed the gender pay gap (GPG) using various Czech data sources. Most samples are derived from Trexima (Jurajda 2003, 2005; Křížková et al. 2008, 2018) and EU-SILC (Mysíková, 2007, 2012; Christofides et al., 2013; Hedija, 2014, 2017, 2018; Pytlíková, 2015; Boll et al., 2016), with Boll et al. (2016) being the only study utilizing the 2010 Structure of Earnings Survey (SES). Our study contributes to the existing body of Czech research by providing estimates from five waves of the SES, spanning 2002 to 2018.

Regarding Slovak GPG estimates, the literature is more limited, with some studies being multi-country analyses already mentioned above. These include early findings by Jurajda (2003, 2005) using Trexima data, Hedija (2017, 2018) based on EU-SILC, and Boll et al. (2016) combining SES 2010 with EU-SILC 2013. Additionally, Harman (2023) utilizes the Slovak sample from SES and presents a study similar to ours. However, our research extends the analysis by including the 2002 SES wave and applying the same estimation to Czech data as well.

3 Methodology and Data

To estimate GPG, we use a basic linear regression model in (1), where the logarithm of earnings of employed person *i*, W_i, is regressed on a female dummy variable (*Fi*) and other observable individual characteristics collected in vector $\boldsymbol{X_i}$. The independent and identically distributed zero-mean error term $\boldsymbol{\varepsilon_i}$ satisfies the exogeneity assumption $\boldsymbol{E(\varepsilon_i|X_i) = 0}$. Regression coefficients β_0, δ, *and* $\boldsymbol{\beta}$ are estimated by ordinary least squares (OLS) and robust standard errors are considered. The main parameter of interest is δ, which expresses the mean difference in log hourly wages for males and females. This parameter represents our estimate of GPG.

$$W_i = \beta_0 + \delta F_i + \boldsymbol{X_i'\beta} + \varepsilon_i \qquad (1)$$

To estimate the regression coefficients in equation (1) above, we use microdata from the Structure of Earnings Survey (SES) conducted in 2002, 2006, 2010, 2014, and 2018. The SES, covering enterprises with at least 10 employees across various economic sectors, provides detailed earnings data and information on employee characteristics (e.g., gender, age, education) and enterprise attributes (e.g., economic activity, workforce size). National statistical institutions collect and prepare the data, which Eurostat compiles for final publication.

The analysis involves the following list of explanatory variables included in vector $\boldsymbol{X_i}$: age (categorized into six groups: under 20, 20-29, 30-39, 40-49, 50-59, over 60), education (divided into four levels from primary to advanced tertiary education), fulltime (a dummy variable=1 if a person works 60% or more of full-time hours, and 0 otherwise), employment contract (a dummy

variable =1 for permanent contracts and 0 for all other contracts), work experience (grouped into categories 0-1, 2-4, 5-14, and over 14 years), firm size (categorized by number of employees: 1-49, 50-249, and over 249), occupational groups (nine categories based on ISCO-08 classification), and sectors (classified into 18 categories according to NACE Rev. 2 codes B-S).

4 Results

This section summarizes our empirical estimates of GPG based on hourly wages and defined by coefficient δ in equation (1), separately for Czechia and Slovakia, as well as for detailed subsamples by age, occupations and sectors of economic activity. Tables 1 and 2 below contain the results for the two countries by age groups. GPG in both observed countries has followed a similar trajectory, showing a general decline across all age groups from 2002 to 2018. In 2002, significant wage gap was evident, particularly in the 20-29, 30-39, and 40-49 age groups, with more pronounced disparities in Slovakia. The highest GPG was observed in the 30-39 age group, with Slovakia at 31.2% and the Czech Republic at 30.1%, likely due to the motherhood penalty, as women in this age group typically have children requiring significant care, impacting their wages. By 2010, 2014, and 2018, the highest GPG shifted to the 40-49 age group, reflecting a trend of starting families later in life.

Table 1 GPG by age categories in Czechia, hourly wages

Age	2002	2006	2010	2014	2018
14-19	-11.0%	-11.5%	-6.8%	-11.2%	-8.6%
20-29	-19.3%	-17.2%	-12.0%	-13.3%	-13.2%
30-39	-30.1%	-28.2%	-22.1%	-21.8%	-20.0%
40-49	-25.7%	-25.6%	-22.9%	-25.0%	-22.7%
50-59	-20.9%	-20.6%	-17.5%	-18.6%	-18.4%
60+	-13.4%	-9.9%	-7.5%	-10.2%	-10.5%

Sources: Structure of Earnings Survey, Eurostat; own calculations.

Table 2 GPG by age categories in Slovakia, hourly wages

Age	2002	2006	2010	2014	2018
14-19	-17.2%	-13.0%	-13.1%	-9.5%	-8.4%
20-29	-27.8%	-21.2%	-15.1%	-11.1%	-14.5%
30-39	-31.2%	-31.8%	-25.9%	-17.8%	-22.1%
40-49	-27.4%	-29.3%	-26.0%	-23.3%	-25.3%
50-59	-22.8%	-23.4%	-20.7%	-19.0%	-20.4%
60+	-14.3%	-10.0%	-7.7%	-10.2%	-12.6%

Sources: Structure of Earnings Survey, Eurostat; own calculations.

Next, Tables 3 and 4 below show GPG estimates for the two countries over time and by occupation types. An optimistic finding is that GPG has decreased across all occupations in both countries. Among high skilled occupations in the first three rows of the tables, the category of Managers stands out with high levels GPG. This is consistent with studies highlighting the low representation of women in leadership positions. Both countries produced high gaps in years 2002 and 2006. Since 2010, Slovakia has kept the elevated level of GPG in this category, while for the Czech

Republic, the GPG of Managers has been decreasing steadily since 2010. Among lower-skilled occupations in the lower six rows of Tables 3 and 4, the highest GPG estimates were found in the category of craft workers for both countries. High GPG values were also observed for the jobs of plant and machine operators and assemblers. These wage disparities are likely due to the predominantly male workforce in these physically more demanding jobs, typically requiring secondary education in technical fields. Consequently, the comparative disadvantage of women in these occupations results in more pronounced wage gaps. Conversely, the category with the lowest GPG in both countries was associated with skilled agricultural, forestry, and fishery workers.

Table 3 GPG by occupational groups in Czechia, hourly wages

	2002	2006	2010	2014	2018
Managers	-32.4%	-29.1%	-19.5%	-16.8%	-19.1%
Professionals	-21.9%	-13.7%	-13.9%	-15.4%	-16.0%
Technicians and accociate professionals	-21.7%	-24.9%	-21.2%	-20.8%	-21.0%
Clerical support workers	-18.4%	-16.1%	-18.4%	-17.9%	-18.1%
Service and sales workers	-19.2%	-20.3%	-17.9%	-18.3%	-15.0%
Skilled agricultural, forestry and fishery workers	-12.8%	-6.3%	-13.9%	-14.2%	-12.2%
Craft related trades workers	-32.1%	-29.7%	-29.2%	-30.1%	-25.1%
Plant and machine operators, and assemblers	-25.0%	-21.9%	-20.6%	-20.9%	-16.4%
Elementary occupations	-16.1%	-17.1%	-10.9%	-15.7%	-15.9%

Sources: Structure of Earnings Survey, Eurostat; own calculations.

Table 4 GPG by occupational groups in Slovakia, hourly wages

	2002	2006	2010	2014	2018
Managers	-32.6%	-28.1%	-25.4%	-25.8%	-24.9%
Professionals	-17.8%	-12.5%	-14.1%	-15.8%	-16.6%
Technicians and accociate professionals	-19.3%	-19.1%	-15.7%	-15.7%	-19.4%
Clerical support workers	-20.9%	-15.2%	-15.2%	-11.9%	-13.4%
Service and sales workers	-20.8%	-22.9%	-21.6%	-20.4%	-17.0%
Skilled agricultural, forestry and fishery workers	-7.4%	-8.4%	-9.2%	-11.0%	-10.3%
Craft related trades workers	-41.9%	-47.6%	-38.2%	-40.2%	-31.8%
Plant and machine operators, and assemblers	-36.2%	-34.8%	-24.5%	-26.0%	-24.9%
Elementary occupations	-16.7%	-18.1%	-15.7%	-19.1%	-17.0%

Sources: Structure of Earnings Survey, Eurostat; own calculations.

Finally, Tables 5 and 6 below present our results by sectors of economic activity. The largest wage disparities in both countries occur in male-dominated economic sectors, such as mining and quarrying; manufacturing; electricity, gas, steam and air conditioning supply; and construction. However, in the Czech Republic, the GPG in these sectors has decreased over time. Similarly, in Slovakia, some sectors have experienced a decline, with the GPG in electricity, gas, steam, and air conditioning supply nearly halving from 2002 to 2018. Conversely, the GPG has increased in sectors like manufacturing and transportation and storage. Other typically male-dominated activities with significant GPG include financial and insurance activities, and information and

communication. In Slovakia, the GPG in financial and insurance activities shows a declining trend, while in information and communication, it has slightly increased. In the Czech Republic, both sectors exhibit a rising GPG trend over time.

Table 5 GPG by sectors of economic activity in Czechia, hourly wages

	NACE	2002	2006	2010	2014	2018
B	Mining and quarrying	-26.7%	-26.0%	-24.5%	-21.8%	-19.6%
C	Manufacturing	-26.7%	-24.2%	-23.5%	-23.9%	-20.8%
D	Electricity, gas, steam and air cond. supply	-26.1%	-25.0%	-18.0%	-17.5%	-17.5%
E	Water supply; sewerage, waste manag.	-22.2%	-21.7%	-18.3%	-16.4%	-16.7%
F	Construction	-32.0%	-29.2%	-18.5%	-19.0%	-19.5%
G	Wholesale and retail trade; repair of mot. v.	-20.6%	-22.5%	-24.0%	-24.6%	-20.6%
H	Transportation and storage	-19.3%	-19.2%	-17.2%	-18.2%	-18.4%
I	Accommodation and food service activities	-32.8%	-25.3%	-15.3%	-12.9%	-13.4%
J	Information and communication	-15.7%	-12.7%	-22.7%	-23.4%	-21.3%
K	Financial and insurance activities	-9.8%	-25.8%	-28.5%	-26.9%	-29.0%
L	Real estate activities	-11.8%	-11.1%	-17.1%	-7.8%	-6.1%
M	Professional, scientific and technical act.	-16.3%	-17.1%	-13.2%	-16.0%	-19.5%
N	Administrative and support service act.	-18.1%	-16.5%	-6.5%	-9.7%	-8.8%
O	Public admin. and defence; comp. soc. sec.			-16.2%	-15.9%	-17.7%
P	Education			-8.9%	-10.5%	-9.6%
Q	Human health and social work activities			-16.8%	-18.0%	-15.1%
R	Arts, entertainment and recreation			-8.6%	-12.2%	-10.2%
S	Other service activities			-3.3%	-14.8%	-4.3%

Sources: Structure of Earnings Survey, Eurostat; own calculations.

The smallest but still present wage disparities in both countries are observed in typically female-dominated occupations, such as Education and Administrative and Support Services, which include activities like agency work, office services, and event organization. In the Czech Republic, wage differences are more favorable for women in sectors like Arts, Entertainment and Recreation, Real Estate Activities, and Healthcare and Social Assistance. Conversely, Slovakia shows better outcomes than the Czech Republic in categories such as Professional, Scientific, and Technical Activities and Other Services, which include membership organization activities, computer and household repairs, laundry, and hairdressing services. Notably, in 2014 and 2018, Slovakia even exhibited positive wage discrimination in favor of women in these sectors. This outcome may be due to the predominance of women in these economic activities, positively influencing women's wages.

Table 6 GPG by sectors of economic activity in Slovakia, hourly wages

	NACE	2002	2006	2010	2014	2018
B	Mining and quarrying			-23.6%	-21.7%	-24.6%
C	Manufacturing	-23.9%	-20.0%	-30.1%	-29.2%	-26.7%

D	Electricity, gas, steam and air cond. supp.	-37.2%	-37.2%	-16.1%	-18.8%	-20.2%
E	Water supply; sewerage, waste manag.	-13.8%	-19.9%	-8.9%	-11.1%	-12.9%
F	Construction	-23.0%	-23.9%	-19.2%	-17.7%	-20.3%
G	Wholesale and retail trade; repair of m. v.	-28.5%	-26.3%	-23.8%	-20.7%	-20.1%
H	Transportation and storage	-12.8%	-16.7%	-17.3%	-16.7%	-19.3%
I	Accommodation and food service act.	-14.6%	-14.1%	-7.9%	-9.9%	-7.4%
J	Information and communication	-21.3%	-21.4%	-17.3%	-21.5%	-22.6%
K	Financial and insurance activities	-28.6%	-17.7%	-24.4%	-19.5%	-21.90%
L	Real estate activities	-9.3%	-14.2%	-15.1%	-10.5%	-11.7%
M	Professional, scientific and technical act.	-12.1%	-11.1%	-8.9%	-7.8%	-11.6%
N	Administrative and support service act.	-15.2%	-15.0%	-16.5%	-13.8%	-12.2%
O	Public adm. and defence; comp. soc. sec.	-19.6%	-7.0%	-24.5%	-20.7%	-20.0%
P	Education			-6.2%	-7.7%	-6.5%
Q	Human health and social work activities			-20.4%	-20.9%	-20.4%
R	Arts, entertainment and recreation			-10.0%	-14.8%	-7.7%
S	Other service activities			-3.6%	11.6%	11.0%

Sources: Structure of Earnings Survey, Eurostat; own calculations.

5 Conclusion

This paper aimed to investigate and compare gender pay gaps in Slovakia and the Czech Republic, with a focus on the factors contributing to these disparities. The findings suggest that gender pay gaps in both countries are broadly similar, likely reflecting their shared cultural and institutional histories. Additionally, the analysis shows that these gaps have gradually decreased over the studied period. However, pay gaps tend to be wider when considering earnings that include bonuses alongside basic wages. The study hypothesized that gender pay gaps would be particularly pronounced in physically demanding, medium-skilled blue-collar occupations, the financial sector, and supervisory roles, while expecting smaller gaps in education and social work. The analysis confirmed that the most significant disparities occur in age groups where women are likely raising young children, highlighting the negative impact of motherhood on women's earnings.

The study also explored gender pay gaps across various occupations and economic activities. As expected, significant wage gaps were observed in leadership roles, manual labor occupations, and sectors such as mining, manufacturing, and financial services, reflecting the male-dominated nature of these fields. Conversely, lower wage differentials were found in traditionally female-dominated sectors such as education and administrative support. Notably, in Slovakia, certain sectors even exhibited wage discrimination against men. This detailed analysis of gender pay gaps by occupation and economic activity underscores the persistent inequalities in the labor market and the need for targeted interventions to address these disparities.

The study’s findings contribute to the understanding of gender pay gaps in Slovakia and the Czech Republic, revealing that while progress has been made, significant disparities remain, particularly in specific sectors and age groups. These insights underscore the importance of continued research and policy initiatives aimed at reducing wage inequalities and fostering a more equitable labor market.

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