

GENDER PAY GAP IN THE CZECH ECONOMY WITH ACCENT ON ICT PROFESSIONALS

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Abstract The subject of our article is a comparison of the level and development of the gender pay gap between selected EU countries (especially the V4 countries and other selected countries such as Austria and Slovenia) for the period 2009 - 2019. The analysis for the Czech Republic will be then supplemented by a comparison with the development of the gender pay gap in the economy and in ICT Professionals. To approximate the development of wages and GDP, we used the method of linear regression together with the method of least squares. All regression analysis calculations are performed at the 5% level of significance.

Keywords:

gender
pay
gap,
V4 countries,
Czech ICT
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1 Introduction

It is seventy years since the International Labor Organization announced the "Equal Remuneration Convention". Usually, the nature of the inequality is determined by the gender of the recipient of the remuneration for work. One of the European Union's priority objectives in the social area is the gradual equalization of the status of women and men in society. Different aspects of equality are discussed in various strategic documents of the European Union. One of them is the gender equality strategy for 2020-2025, where the President of the European Union, Ursula von der Leyen, states: "**Gender equality is a core principle of the European Union**, but it is not yet a reality. In **business, politics and society** as a whole, we can only reach our full potential if we use all of our talent and diversity. Using only half of the population, half of the ideas or half of the energy is not good enough." (European Commission, 2020). A similar strategy between 2016 and 2019 (Gago, 2019) focuses on one of the dimensions of equality in the business sector, i.e. **the gender pay gap**, which means equal pay for equal work. One of the initial documents assessing this situation is the document (European Commission, 2017), which presents the results of the measures in 2016 and 2017 and states, inter alia: "Reducing the gender pay gap is an important priority for the Commission, as set out in the Strategic Engagement for gender equality 2016 – 2019." (European Commission, 2017).

A number of authors, both in the United States and in Europe, tackle the issue of equal pay for women and men and monitor the actual situation and trend in this area. These two world economies have declared the solving of the gender pay gap to be their major societal priority.

Two main groups of studies focus on the gender pay gap. The first group analyzes and compares the trend of the gender pay gap in the economy of different countries over time. With respect to this first group, we can mention e.g. the article Gender Pay Gap Statistics (Eurostat, 2020). Another important study analyzes the gender pay gap in the EU Member States (European Commission, 2019). The latest data for the EU are provided e.g. in the study (Landmesser et al., 2020). The study Bergmann et al. (2019) analyzes this gap in the German and Austrian economies and the older study Geisberger, T. Glaser T. (2014) analyzes this gap in the German economy. The study Mitková (2018) analyzes the

situation in the Slovak Republic. A brief report on the situation and trend of the gender pay gap in the Republic of Slovenia is featured e.g. in (**Total Slovenia News**, 2020).

The second group of studies focuses on the trend of certain segments in the economy. For conditions of the Czech Republic for example (Nedomova at al., 2017, Marek at al., 2018). The study Bergmann at al. (2019) provides both a macroeconomic and sectoral perspective.

The second part of our article discusses the issue of ICT Professionals and the trend of the gender pay gap among them. The current studies concerning the gender pay gap in the Czech Republic include in particular (Marek, Doucek, 2016). As our research has shown, it depends on whether ICT Professionals work in the private sector or in the public sector. In this respect, we followed up on the results of the study (Bradley at al., 2015).

The goal of our article is to analyze the trend of the gender pay gap in the V4 countries (Visegrad four countries – Czech Republic, Hungary, Poland and Slovak Republic), including two selected countries – Austria and Slovenia – and to show the trend of the gender pay gap among ICT Professionals in the Czech Republic. For the needs of the article, we have formulated the following Research Questions:

- RQ1: What is the development of the Gender pay gap in the Czech Republic in comparison with the V4 countries, Austria and Slovenia in the years 2009 - 2019.
- RQ2: What is the comparison of the development of the gender pay gap in the Czech Republic for the whole economy and for ICT Professionals in the years 2009 - 2019.

2 Methodology

To answer our research questions, we used the following methods:

- Input research data (from the Eurostat database and from Trexima a.s.);
- Definition of ICT Professionals;
- Data analysis.

2.1 Input research data

To answer RQ1, we analyzed the data from the Eurostat database (Eurostat, 2020).

The input data file that we used for our analysis comes from Trexima, a.s., that processes the AEIS (Average Earnings Information System) on a yearly basis (ISPV, 2020). This file contains data about earnings in the second quarter of each year because it includes the highest number of available workhours and a minimum number of national holidays and thus these earnings reflect the most the basic salaries of wages. The main monitored indicators in terms of earnings include **gross monthly wages** and hourly earnings. In our analyses, we worked with a sample of data for ICT Professionals ranging from 22,450 records in 2009 to 63,563 records in 2019. We analyzed the gross monthly wage in Czech Crowns, based on which we then calculated the annual gender pay gap. The data analyzed for RQ1 are data that Eurostat already shows as a percentage of gross wages in the local currency.

2.2 Who are ICT Professionals?

To identify the profession of ICT Professionals, we used the CZ_ISCO classification (CZSO, 2020) that breaks down ICT Professionals into two main groups of professions – **ICT Specialists** (CZ_ISCO 25) and **ICT Technicians** (CZ_ISCO 35). We analyzed the data for these two groups and compared the obtained results from a gender pay gap perspective.

2.3 Data analysis

We used the method of linear regression to analyze the data obtained from the Eurostat database. We used the method of least squares to interpolate data series with an approximation line.

We used the average gross monthly wage in Czech Crowns from the ISPV survey, based on which we then calculated the annual gender pay gap. However, the total average wage is influenced by monthly wages that exceed CZK 100,000.

This category represents approximately 1.5% of the analyzed records in 2019 and their percentage in the analyzed data goes up every year as wages in the Czech Republic go up.

We calculated the gender pay gap for all identified records of ICT Professionals. We also found out that the fact whether ICT Professionals work in the private sector or the public sector had a significant impact on the gender pay gap. Therefore, we added this dimension to our analysis as well.

The data adjusted for inflation and converted to EUR were then processed and analyzed, using MC Excel tools and statistical functions for analyzing time series. To approximate the trend of wages, we used the method of linear regression together with the method of least squares. In the method of linear regression, we used the general function $y = ax + b$, where a represents the identified trend during the analyzed time period. All performed regression analysis calculations are at the 5% confidence level.

3 Results and Discussion

We evaluated the trend of the gender pay gap in the V4 countries as well as in other selected countries – Austria and Slovenia. Regarding the gender pay gap in the EU Member States in 2019, Gender Pay Gap Statistics (Eurostat, 2020) show that in 2019 **the average gender pay gap in the EU Member States was 14.7%**; the biggest gender pay gap was in Estonia (22.7%) and the smallest gender pay gap in Romania (3.0%). What is the situation in the V4 countries and the selected countries – Austria and Slovenia? RQ1 provides the answer.

RQ1: What is the development of the Gender pay gap in the Czech Republic in comparison with the V4 countries, Austria and Slovenia in the years 2009 - 2019.

Fig. 1 shows the trend of the gender pay gap in the V4 countries, Austria and Slovenia.

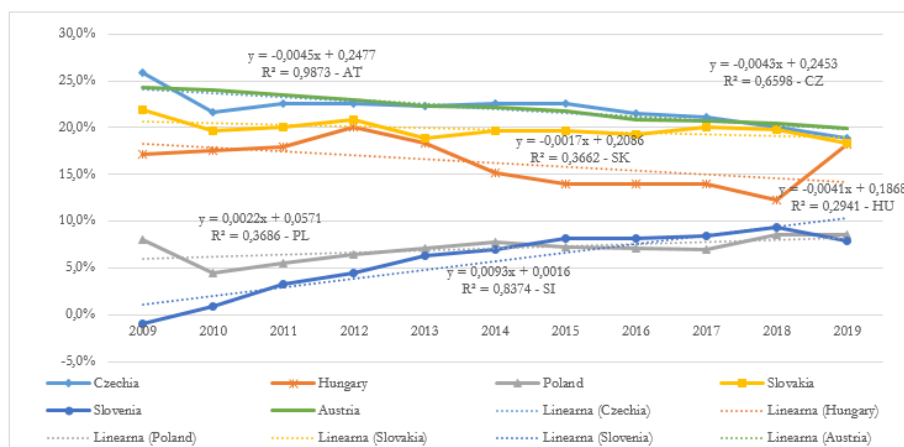


Figure 1: Trend of the gender pay gap in the V4 countries, Austria and Slovenia

Source: authors, data (Eurostat, 2020)

The trend of the gender pay gap has basically divided these countries into two main groups. While the first group (Austria, Czechia, Slovakia) with a very high gender pay gap converged towards 20% at the end of the analyzed time period, which is well above the European average in 2019, the second group (Hungary, Poland, Slovenia) converged towards approximately 10%, which is below the EU average in 2019.

Practically all three countries in the first group converged down towards 20%. Their gender pay gap was over 20% at the beginning of the analyzed time period; Slovakia's gender pay gap actually went down to 18.4% in 2019. The Czech Republic had the highest drop – by 7.0 percentage points – during the analyzed time period. Very special is the situation in Hungary. After permanent decreasing gender pay gap to 2018, it increased dramatically to the value of 18,2 % in 2019 (Fig. 1).

Table: 1 Gender pay gap at the beginning and the end of the analyzed time period

Country	Gender pay gap in 2009 in %	Gender pay gap in 2019 in %	Difference – percentage points
Austria	24.3	19.9	-4.4
Czechia	25.9	18.9	-7.0
Hungary	17,1	18.2	1.1
Poland	8.0	8.5	0.5
Slovakia	21.9	18.4	-3.5
Slovenia	-0.9	7.9	8.8

The situation in the second group of countries is not so simple because the gender pay gap in Slovenia is converging up towards 8 %, the gender pay gap in Poland practically oscillates around 8% - 8.5%. Slovenia with stable increasing trend attacks the level of 8 percentage points to reach.

The year 2010 was interesting because the gender pay gap in the Czech Republic, Slovakia and Hungary sharply decreased. In the case of the Czech Republic, we can explain this fact by the drop in the average gross wage, which was caused by the economic crisis.

The estimated trend (trend line slope) and the estimate confidence level are shown in Tab. 2.

Table 2: Approximation lines of the linear regression of the gender pay gap trend in the V4 countries and selected countries

Country	Trend line slope	Estimate confidence level (R ²)	Trend
Austria	-0.0045	0.9873	↓
Czechia	-0.0043	0.6898	↓
Hungary	-0.0041	0.2941	↓
Poland	0.0022	0.3686	↑
Slovakia	-0.0017	0.3662	↓
Slovenia	0.0093	0.8374	↑

Based on the data, we can say that Austria meets the most rapidly the EU's efforts to close the gender pay gap – the decrease is the fastest and the estimate confidence level is 0.99, which shows a stable trend. The next in line is Czech Republic that, in addition to the declining trend, shows a clearly high estimate confidence level, which indicates targeted systemic measures implemented in Czech economy to fulfill the strategy of reducing the gender pay gap. Other countries showing a declining trend in the gender pay gap include the Hungary and Slovakia. Both countries keep decreasing this gap, but with different fluctuations, which are reflected in the estimate very low confidence level. Poland oscillates between 8% - 8.5%, and the trend line slope is practically zero – i.e. the trend shows the already mentioned oscillation. Slovenia shows a very untypical trend of the gender pay gap among the countries selected for our analysis. This country had a negative gender pay gap at the beginning of the analyzed time period (the average gross wage of women was higher than that of men), but the pay gap between women and men kept increasing throughout the analyzed time period and this trend has been rather well confirmed by the estimate confidence level, which is 0.84. Based on the estimate confidence level, we can conclude that, similarly to Austria, this trend in Slovenia is stable and supported by systemic macroeconomic measures.

RQ2: What is the comparison of the development of the gender pay gap in the Czech Republic for the whole economy and for ICT Professionals in the years 2009 - 2019.

The trend of the gender pay gap in the Czech economy and among ICT Professionals is shown in Fig. 2.

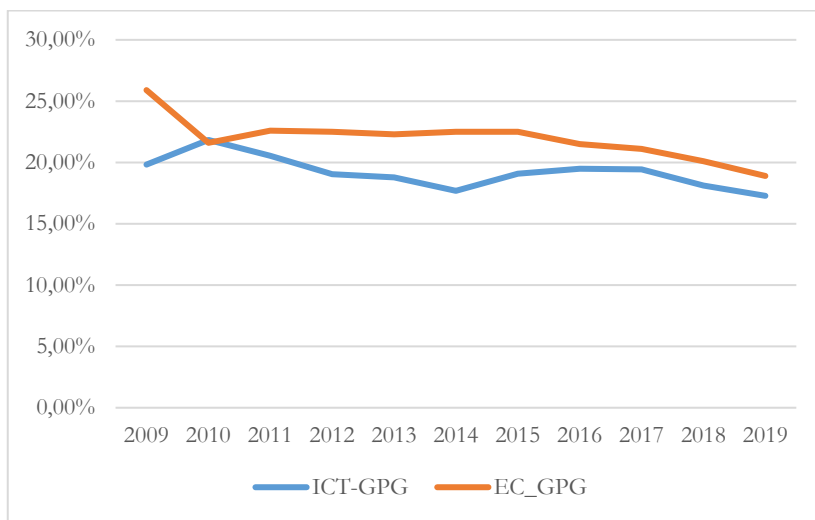


Figure 2: Trend of the gender pay gap among ICT Professionals in the Czech Republic and in the Czech economy.

Note to Fig. 2: ICT-GPG – ICT Professionals gender pay gap, EC_GPG – Gender Pay Gap in the Czech Economy.

Fig. 2 clearly shows a smaller gender pay gap among ICT Professionals than that in the Czech economy. The year 2010 is very interesting since the gender pay gap in ICT Professionals and in the entire Czech economy was almost the same. The sharp increase in the gender pay gap among ICT Professionals was mainly caused by a drop in the wage of this group of professionals, especially in the category of ICT Technicians, both in the business sector (approximately 20%) and in the non-business sector (approximately 15%). In addition to this exception, the gender pay gap among ICT Professionals is constantly below the gender pay gap in the entire Czech economy. The gender pay gap keeps decreasing mainly among ICT Professionals under 30, where the gender pay gap among ICT Specialists was 5% in 2019 and among ICT Technicians 0% in 2016-2018 and 5% in 2019. During our research, we found out that the final identified gender pay gap was significantly influenced by whether ICT Professionals worked in the business sector or the non-business sector. The difference in the gender pay gap based on the sector is shown in Fig. 3.

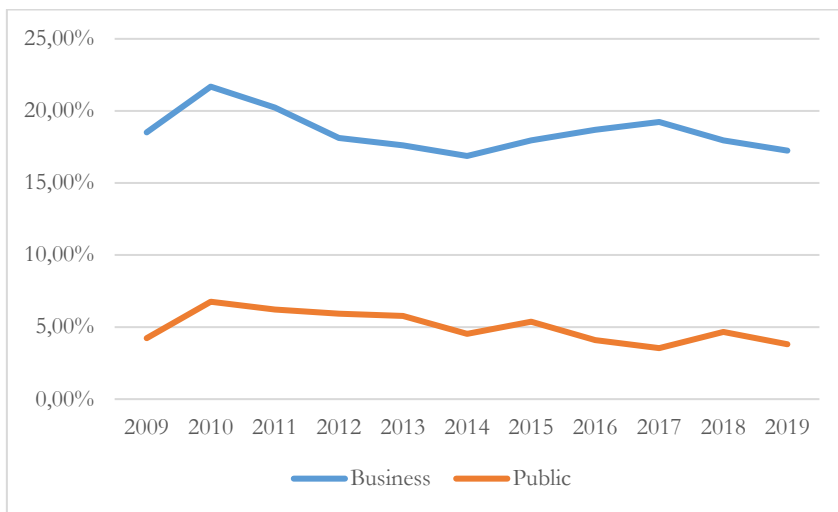


Figure 3: Impact of the sector (business and non-business) on the gender pay gap among ICT Professionals.

Fig. 3 clearly shows that the gender pay gap is significantly greater in the business sector, while the non-business sector, which is very often required to adhere to wage tables, does no longer show a significant gender pay gap; the gender pay gap keeps decreasing and is around 5 %.

3 Conclusions

Our article analyzes the trend of the gender pay gap in the V4 countries, Austria and Slovenia during the years 2009 - 2019. The data from the four analyzed countries (Austria, Czechia, Hungary, Slovakia) with the highest gender pay gaps show a constant decreasing trend. However, the estimate confidence level of this trend varies considerably from country to country (Fig. 1, Tab 2). The situation in Poland suggests a long-term acceptable level of the gender pay gap (approximately 8% - 8.5%), around which the identified gender pay gap oscillated during the entire analyzed time period. The situation is very different in Slovenia that started the analyzed time period with a negative gender pay gap, but this gap kept increasing during the entire analyzed time period. Although the gender pay gap is still acceptable in terms of the total average gender pay gap in the EU Member States, it keeps increasing with a very high confidence level. As a matter of interest, let's estimate, based on the current increase or decrease rate of the

gender pay gap, when the analyzed countries would reach the 2019 average gender pay gap of the European Union – i.e. 14.7%. It would take Austria 22.37 years, the Czech Republic 22.86 years and Slovakia 36.24 years. Slovenia could catch up in 15.63 years, which is actually almost the same number of years for which we have been conducting this research.

The European Union's ambitious plans in this area show small changes, and it will still take a relatively long time (decades) to eliminate this social problem.

The situation in the gender pay gap among ICT Professionals is better than that in the entire Czech economy, as the gender pay gap among ICT Professionals is smaller. In addition, the gender pay gap exists mainly among the older generation of ICT Professionals, while the gender pay gap among the new generation of ICT Professionals is around 5%. There is also a significant difference in the gender pay gap among ICT Professionals, depending on where they work. The details are shown in Fig. 3.

Open issues

When researching the gender pay gap among ICT Professionals in the Czech Republic, we came across an interesting fact – the gender pay gap in 2010 increased by 2.1 percentage points as a result of the impact of the economic crisis on ICT Professionals in the Czech economy. Their wages dropped by almost 8% in 2010. During the following years, their wages were going up and the gender pay gap was decreasing. We will try to verify this relation in our next research.

Let's think about the trend in the Slovenian economy – why is the gender pay gap constantly increasing, which is contrary to the European Union's goals in this area?

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