

DOI: [10.52950/ES.2022.11.2.003](https://doi.org/10.52950/ES.2022.11.2.003)

JOB GRADE CAMOUFLAGE: WHEN LOW GENDER PAY GAP DOES NOT MEAN EQUAL PAY

JAN CADIL, MARTIN KOPECKY, TOMAS JURCIK

Abstract:

“Equal pay for equal work” is one of the backbone principles of Responsible Leadership. It is also deeply incorporated in legislation, mostly in developed countries. In recent decades, the gender pay gap has been put forward as a general indicator of equality by policymakers and researchers alike. Yet, research outcomes are disturbingly unsettled in comparison to bold political proclamations that are often based on simplified statistics. In our article, we show that the gender pay gap shrinks substantially if firm-level job grades (based on the Hay methodology) are used. The methodology used is gender-neutral and focuses solely on the job size, not on the incumbent. Moreover, we show that the gender pay gap does not reflect the idea of “equal pay for equal work” well. In fact, we conclude that people are being paid unequally regardless of their gender. A low or non-existent gender pay gap might then just camouflage real inequalities, leading managers and stakeholders to the false feeling that the company follows responsible leadership principles as defined by Steve Kempster (2016).

Keywords:

gender pay gap, equal pay, responsible leadership, job grade decomposition

JEL Classification: J01

Authors:

JAN CADIL, Unicorn University, Department of Economics and Management, Prague, Czech Republic, Czech Republic, Email: jan.cadil@vse.cz

MARTIN KOPECKY, BDA Advisory, Prague and University of Economics, Department of Management, Prague, Czech Republic, Email: martin.kopecky@vse.cz

TOMAS JURCIK, BDA Advisory, Prague and University of Economics, Department of Management, Prague, Czech Republic, Email: tomas.jurcik@vse.cz

Citation:

JAN CADIL, MARTIN KOPECKY, TOMAS JURCIK (2022). Job grade camouflage: When low gender pay gap does not mean equal pay. International Journal of Economic Sciences, Vol. XI(2), pp. 28-47., 10.52950/ES.2022.11.2.003

Introduction

Equal pay, and especially the gender pay gap (GPG) as its common measurement, has been attracting growing attention over last three decades. It has become one of the most highly discussed socio-political topics, especially in developed countries (Jasova, 2019). Although statistical evidence clearly shows that the inequality of earnings in population generally exists and is connected to factors like gender or race, there is an ongoing debate about what are the causes of such inequality and how to deal with it (or if it should be dealt with at all). Interestingly, while equal pay might look as a modern topic the truth is that it has strong historical roots as can be seen reading Edgeworth (1922) for instance.

Regarding the causes of GPG, a simple explanation pointing at workplace sex discrimination had been often put forward since 1970's when the topic started to be popular (Oaxaca 1973). However, researchers realized quite early on that gender pay gap as a simple ratio of mean salaries between men and women does not reflect the possible discrimination well. Various decomposition methods have been used since the 1970s, including the famous Oaxaca-Blinder decomposition (Oaxaca 1973, Blinder 1973). This method in particular is very popular and widely used even today. It splits the gap between "explained" and "unexplained" (or adjusted) parts, while trying to control the gap for explanatory variables like experience or education and thus reducing (adjusting) the gap.

Nevertheless, the Oaxaca-Blinder method often seems to produce upward biased results, overestimating the unexplained part of the gap (see the detailed description in the methodological section of the paper). As an example of recent research utilizing the Oaxaca-Blinder decomposition, a recent report of Boll et al (2016) for European Commission can be cited. According to this report, the unexplained part of the gender pay gap in the EU was 10,9 %, accounting for 71 % of the total unadjusted gap.

Our second and possibly more important task was to test the suitability of gender pay gap as an indicator of equal pay in the general sense of "equal pay for equal job". Implicitly, we test for the responsible leadership and effective human resources management of the Czech companies as well. As companies that implement responsible leadership should pay in interval from 80%-120% of the average salary for the same job. (Milkovich 2014, Mondy 2014, Armstrong 2007). Using a simple max/min ratio, we may assume the company follows responsible leadership if this ratio is not higher than 1,5 (1,0 means perfectly equal when maximum equals minimum). We found out that the vast majority of Czech companies are well above the 1,5 threshold. That means the companies do not follow responsible leadership and possibly do not allocate resources efficiently (Kempster 2016).

Consequently, by comparing the maximum/minimum salary ratio (adjusted by company and job grade), and gender pay gap (adjusted the same way), we test the assumption that the gender pay gap is a suitable indicator of general pay equality. Surprisingly, the correlation between the gap and max/min ratio is rather weak or non-existent. These findings are supported by the regression analysis we performed controlling for other variables that may affect the inequality. The estimation output seems statistically reliable yielding no statistical relation between gender pay gap and equality measured by max/min ratio. In other words, it seems that employees in our sample doing the same job are not paid equally, regardless of their gender. Our findings are important especially because gender pay gap is today used as a common measurement of equal pay in a sense "equal pay for equal work". Although our findings could be biased by using only local (Czech) companies

and should be backed by similar studies worldwide, we at least would like to initiate a debate as to if gender pay gap is really a suitable indicator of equal pay.

Despite the prevailing popularity of Oaxaca-Blinder decomposition or similar decomposition methods, Blau and Kahn (2016) stress that gender pay gap research is still an area of active and innovative research. Truly, contemporary research tries to either improve the decomposition by adding more relevant variables or overcome the limitations of Oaxaca-Blinder decomposition by using different approaches. For example, Chamberlain (Glassdoor, 2016) uses Oaxaca-Blinder decomposition adding gradually more controls into the equation showing how crucial is the proper selection of controlling variables for estimating the adjusted gap in fact. The unexplained part of the gender pay gap for the US shrinks from initially 27 % (total compensation) to 22 % when controlling for education and experience, then further to 11,3 % when controlling for industry, occupation, state, year and firm size and furthermore to 7,4 % when controlling for company-specific controls and job-title specific controls. The “unexplained” part of the gap is then just 27 % of total gap. Taking a look at France, Germany and the U.K., and after controlling for all the variables, the results are very different from Boll et al (2016). The unexplained part of the gap is 33 % for the case of the U.K., 21,6 % for Germany and 38,5 % for France.

An example of a substantially different approach could be the recent study of Frost et al (Korn Ferry / Hay Group, 2016). They use a complex set of indicators when a company itself is making a “job grade”, specific for every company. The advantage is that companies themselves define the job grade, taking into account all relevant requirements for the grade. Job grade is then a company-specific variable that should reflect factors that are normally unobservable by external researcher (like risk-taking ability, stressful environment, financial responsibility etc.).

In comparison to traditional approaches like Oaxaca-Blinder decomposition, the advantage lies in the hidden complexity of a job grade. In their 2016 study, the Korn Ferry group comes with a surprising conclusion. Using company-level data and controlling for job grade and the company itself, they found no statistically significant gender pay gap on the company level. Although these findings are not surprising for some researchers, as is explained below, they should be at least considered by policy makers who often tend to impose regulations which could be quite misleading in this case. Moreover, Korn Ferry/Hay Group findings can be presented as a support for incorporating formal systems into companies to reduce the gender pay gap.

In our article, we want to contribute to current debate from two perspectives. Firstly, we analyse firm-level data of companies in the Czech Republic and show that when controlling for job size (using the Hay Group method), the gender pay gap is substantially reduced, especially at the firm level.

Secondly, we want to address the issue of responsible leadership in relation to equal pay in terms “equal pay for equal work”. According to compensation should be in intervals (-20%,+20%) around the average for the same job position and same job grade (Mondy 2014, Milkovich 2014, Armstrong 2007) to be aligned with Responsible Leadership values (Kempster 2016). This should be applied regardless the gender. Moreover, as the gender pay gap is considered to be a common indicator of equal pay, we should assume a strong relationship between Responsible Leadership, equal pay and gender pay gap. Contemporary research but also political practice uses both terms equally. A low gender pay gap often automatically means pay equality in the sense of “equal pay for equal work”.

However, the gender pay gap is just a subgroup of equal pay and it is highly questionable if it works as a general indicator of equal pay. We want to ask and answer the question if gender pay gap really corresponds with equal pay in terms of “equal pay for equal work”. Our findings support similar, but probably overlooked, conclusions of Mayersson Milgrom et al (2001). We conclude that either the job size system is flawed (which is unlikely to be the case as companies define the job-size themselves) or companies do not follow equal pay and responsible leadership principles. Either way, we show that employees are not paid equally within equal job grades regardless of their gender. Moreover, we find no statistically significant relation between an equal pay and a gender pay gap. In other words, low gender pay gaps within job grades are in fact camouflaging existent inequalities independent of gender.

Literature review - GPG theoretical background and political implications

Although there are many factors that influence the gender pay gap, contemporary research and statistical evidence shows that it is the gender labour market segregation which is by far the dominant factor laying behind the gap. Literature usually distinguishes between horizontal and vertical segregation (see Bettio and Verashchagina, 2009 for example).

Horizontal segregation is related mainly to industrial occupation and means that men are overrepresented in certain industries (like IT or machinery) while women dominate other industries (like education or health-care). Recent studies show that such horizontal segregation usually accounts for more than half of gender pay gap (Mayersson Milgrom et al. 2001, Chamberlain 2016, Blau and Kahn 2016) because women tend to dominate industries with relatively lower earnings in comparison to male-dominated industries. If all industries were occupied equally by men and women, the gender pay gap would probably shrink substantially. However, such scenario is unlikely to happen as industrial segregation is nearly immutable in time (Anker 1998) and will continuously cause the gender pay gap to hold.

Vertical segregation is addressing mainly the fact that women do not occupy positions in top management as frequently as men. While this imbalance has been substantially improving in time (Blau and Kahn 2016), there is still minority of women in leading positions in most of the countries and firms (Chanavat and Ramsden 2014, Catalyst 2013).

The logical question that many researchers are trying to answer today is why women tend to work in low-paid industries and why they do not occupy high managerial functions so frequently. One of the most cited theories that explains this situation is the theory of human capital. This theory relates mainly to Gary Becker (1964, 1971) and was introduced in gender pay gap context mainly by Mincer and Polachek (1974), Polachek (1981) and Polachek and Xiang (2014). Simply put, the theory of human capital says that individuals tend to invest into their education and skills on basis of expected returns.

Women are supposed to expect less than men – because of maternity leave and family care their working lives are shorter in comparison to men and they have also lower labor participation rate. They utilize more part time jobs as well or opt for self-employment during their working life (Lawter et al 2016). This lowers their expectations about future earnings and therefore their investment into education and career. They ex-ante prefer jobs that allow them to care for family and they adjust their education accordingly. Men on the contrary invest more in their know-how and skills which is resulting in higher productivity and earnings (Blau and Kahn 2000).

Contemporary research supports the role of human capital in gender pay gap, but to a limited scale. It seems that in the past two decades the education level of women as well as their experience and participation rate on labor market increased substantially (Blau and Kahn 2016). Although the gender pay gap has been reduced accordingly, human capital in terms of education level explains quite a bit of the marginal portion of gender pay gap now (Blau and Kahn 2016, Chamberlain 2016). The fact is that women today study even more than men in many developed countries. In 2014, 57% of tertiary education graduates in OECD countries were females (OECD 2016), but the structure is very different. While women tend to graduate in fields like education or health and welfare, men are oriented on science, engineering, manufacturing and construction (OECD 2016). The horizontal (industry) segregation will surely hold if such segregation is present in education itself. It can be concluded that while education might reduce the gap caused by vertical segregation, horizontal segregation remains intact as predicted by Anker (1998). It is questionable if women should be somehow attracted more to studies of science, technology and engineering as Korn Ferry/Hay Group study (2016) or European Commission “Gender Equality” report (2013) suggest or if it is a matter of natural preferences that should be left on individuals and the labor market development (Shackleton 2008).

Besides human capital, there are other theories that might explain the horizontal and vertical segregation. Recent research focuses on behavioral problems like bargaining power (Card et al 2016) or risk-taking attitude (Le et al 2011), but there are surely many other factors in play. The problem is complex and the reasons for women’s education and workplace preferences and consequent horizontal segregation are still rather unclear.

During recent decades, gender pay gap has become an increasingly important political and social issue and in fact replaced equal pay as its general measurement. However equal pay is a broader concept which means “equal pay for equal work” – regardless of gender, race, religion, age or any other quality that does not affect the work outcome. When NGO’s talk about equal pay they mean gender pay gap – “Equal pay day” that is a world-wide action oriented solely on gender equality. However, narrowing equal pay just on gender might be misleading. Milgrom et al (2001) correctly reminds us that if gender pay gap does not reflect unequal pay for equal work then it may reflect unequal use of equally qualified human resources, causing potentially great losses to the economy. Developed countries incorporate policies that should ensure equal pay but in fact are oriented mainly on gender pay gap. For instance, U.S. adopted Equal Pay Act of 1963 that states: “The Equal Pay Act requires that men and women in the same workplace be given equal pay for equal work.” Although race, religion and other possible discriminating factors are mentioned in other Acts (mainly Age Discrimination in Employment Act of 1967) it is obvious that equal pay is meant as a gender discrimination problem. Most of developed countries have adopted similar legislative acts since 1960’s, however its effect on gender pay gap was surprisingly quite negligible (Meyersson Milgrom et al 2001).

The increasing political and social pressure on equal pay has been reflected by private or public institutions of course. Many companies today run personnel audits or incorporate formal job evaluation systems like Hay Grade to avoid discrimination. But again, they focus mainly on the gender pay gap rather than equal pay as general. Our intention here is to question the link between equal pay and gender pay gap. We show that adopting formal systems like Hay might help reducing or at least explaining the gender pay gap as documented by Burk (2013). Nevertheless, it does not mean that equal pay as “equal pay for equal work” is ensured at the same time.

Data and methods - estimating the gap

In spite of the clear complexity of GPG, contemporary estimates of gender pay gap are quite straightforward even when controlling for explanatory variables. The simplest way to estimate the gender pay gap is just to compare mean hourly wages of men and women. Such measurement is very simplified and probably seriously flawed but is often used, especially in political debates. For example, using this indicator, the Czech Republic has one of the highest gender pay gaps among the EU countries – 22,5% being at the second worst place (Eurostat 2015).

However, when taking median instead of mean, the gap usually drops down. It is caused mainly by a different distribution while men's wages have heavy upper tail. Hence the median wage is considerably smaller in comparison to mean wage for men while the difference is smaller in the case of women. For the case of the Czech Republic, the median gender pay gap is just 16,5%. However, we cannot say that using the median gap is more correct than mean gap. The information both indicators deliver is slightly different. While median better captures the gap confronting average person, the mean allows us to include the whole sample including extremes. So, if we try to address the "glass ceiling" issue for instance, it is better to use mean as the shift of highly paid women (above 50%) to even better paid position will not be reflected in median gap.

Another factor that might affect the gender pay gap calculation is the use of hourly or weekly wages and part time jobs and overtime issues. Women in average tend to work less hours per week than men – especially due to family caregiving they often prefer shorter working time (part time jobs). Using weekly wages would then yield larger pay gap than for hourly wages. A similar situation goes for overtime – again men tend to work overtime more often than women. If the overtime salary is higher than the standard hourly rate then the gap is widened again. To avoid differences in working time between men and women, the standard approach for gender pay gap estimation is to use hourly wage rates (Plantenga, Franssen 2010). Nevertheless, some researchers like Anderson et al (2001) put forward that the higher share of women working for part time is contributing to gender pay gap greatly. They believe that the hourly wage rate is much lower for part time jobs in comparison to full time jobs. Jasova (2021) confirms that women and youth work more often part time and at the same time in industries where wage is actively limited by the minimum wage bound. The reason is mainly due to occupation, as part time jobs are often low-level, low-paid jobs. Moreover, it is possible that employers rationally pay higher premiums to compensate their employees who stick to the full-time full-year (FTFY) standard (Goldin 2014). Interestingly, when comparing the gaps for part-time and full-time employees, developed countries differ a lot. For example, Germany has the mean gap of 22% while full-time gap is 18,9% and part time gap -1,1% (Eurostat 2015). This indicates that women in Germany have higher average wage rate in comparison to men working part-time.

When explaining the pay gap, researchers often try to decompose the gap using a set of controlling variables (like education, age, occupation etc.) in line with the theoretical debate outlined above. The Oaxaca-Blinder decomposition method is still widely used today (Oaxaca 1973, Blinder 1973) to disaggregate the gap into explained and unexplained components. The unexplained component is the "adjusted" gender pay gap – the gap that takes into account controlling variables and is usually associated with discrimination. A lot of studies utilizing the Oaxaca-Blinder decomposition (in various forms) were conducted in last decades. Those estimates almost always found the unexplained component as a major one, pointing at the discrimination issue in fact. For example, Boll et al (2016) in their report for European Commission estimated the unexplained gap to be

13,1% for the case of Czech Republic, with almost 80% of total gap based on median earnings (16,5%). Mysíková (2012) used a similar decomposition with different controlling variables (like experience or children) and concluded that the unexplained part is about 89%. Hedija and Musil (2011) conclude that observable characteristics explain only 16.5 % to 6.2 % of the gap (therefore the unexplained component being in range from 83,5%-93,8%), depending on the Oaxaca-Blinder approach. Jurajda (2005) estimated 60 percent of the wage gap is remaining unexplained by controlling variables. Such results with a very high unexplained gap are common worldwide; it is not a specific of the Czech Republic.

However, the Oaxaca-Blinder decomposition is facing growing critique in last decades. An often cited problem of Oaxaca-Blinder the decomposition is sample selection bias, which might lead to wrong estimates of gender pay gap (Hernández and Méndez, 2005). Selection bias occurs because men and women may have different patterns in entering the labor market. Heckman (1979) proposed a correction method that is still widely used but again is not flawless. Tenjo et al (2002) put forward the argument that using ad hoc selected variables for describing the process of entering the labor market might produce more problems than the Heckman's correction eventually solves – truly there is well documented substantial variance in results (Lewis 1986, Freeman and Medoff, 1984). Another problem the decomposition method is facing is the selection of independent (controlling) variables (Gunderson 1989, Riach and Rich 2002). This holds true for any econometric model, of course. Omission of important variables might easily demonstrate in constant term overestimation, i.e. a relative overestimation of the unexplained component in gender pay gap decomposition. Atal et al (2009) mentions other problems with the Oaxaca-Blinder decomposition. Firstly, the decomposition works with the average gap, omitting a different distribution of the gap among individuals in the same group. Secondly, they found out that the relation between explanatory variables and wages is not always linear. This violates Mincer's model upon which the decomposition is theoretically based on. Thirdly, the decomposition does not restrict the estimation to comparable individuals, which can lead again to an upward bias of the unexplained component (Hirsch et al 2013).

The first issue has been addressed by several studies mostly utilizing quantile regressions (most cited is probably the framework of Machado and Mata, 2005). These studies usually confirm quantile-different gender pay gap, but their results are not uniform. For example, Albrecht et al (2003) or Arulampalam et al. (2007) found a higher gap in higher income quantiles in European countries – referring to a “glass ceiling” problem. On the other hand, Sakellariou (2004, 2011), Gunawardena et al. (2008) or Rojas et al (2017) found that much of the gap occurs only in low income quantiles, thus indicating a “sticky floor” problem for the case of Asian countries.

Regarding the common support issue (i.e. to compare comparables), estimation methods utilizing a nonparametric approach involving matching techniques have become popular. Those estimates usually found a substantial reduction in the overall gender pay gap in comparison to standard decomposition, leaving doubts regarding the standard decomposition approach being reliable (Black et al 2008, Nopo 2008). However, even matching techniques should not omit important variables that affect the outcome. The technique of matching the assumption of conditional independence (or unconfoundedness) is violated if the researcher does not incorporate all relevant covariates (Lechner 1999, Rosenbaum a Rubin 1983, Caliendo and Kopenig 2008). Violating the conditional independence assumption means that the estimate suffers from internal invalidity. From the brief analysis of gender pay gap estimation techniques, it seems that comparing

comparable and involving all relevant factors that might explain the gap is crucial for any valid decomposition. However, it is quite difficult to involve all factors that might explain the gap as many of them are difficult to measure or the data are simply not available.

In this paper, we want to use the principle of internal equity in compensation for de-composing and analysing the compensation practice in the companies considered. The internal equity principle is described for example in Adams research of the theory of internal equity (Adams 1965). The internal equity principle is manifested through the analysis of job content and the evaluation of a job size. The job analysis includes collection of information about the job content and its characteristics using several methods: observation, interviews, questionnaires and more specialized methods of job analysis and functional analysis. When collecting information about the job content, HR professionals focus on the aspects of work activities, department or organisational unit structures, interaction with others, performance standards, use of machines and equipment, working conditions, supervision, knowledge, skills and capabilities required for the job.

Job evaluation is based on the job analysis, which was for a long time one of the main HR management activities, and represents a systematic approach to collection and analysis of information about the job content and job requirements, as well as the context in which the job is performed (Mathis, Jackson 1997). The result of the evaluation is expressed in a job grade. All analysed companies are using in their practice the process of job evaluation and their jobs are assigned to specific job grades. Specifically, they use the Hay analytical methodology for managing their internal equity principle and use allocation of jobs into the structure of job grades (Hay reference levels).

A job grade expresses the relative job size compared to other jobs in the organisation and also manages the compensation level related to the job. The allocation to job grades is gender neutral as the job evaluation is performed strictly at the level of job and the concrete incumbents are not considered at all. Companies use job evaluation to ensure that their compensation structure is internally fair and consistent.

Job evaluation is a process which specifies the relative value of a job compared to another job. It actually determines the value of a job for the company (Mondy 2014). Job evaluation and allocation to job grade is based on assumption that a job based structure is evaluating what people are doing and what is the expected outcome of their activities (Milkovich 2014). Job evaluation is a solid, systematic process and an integral part of modern management that helps evaluating requirements for every job and its relative value. Job evaluation is essential for compensation management. It builds a foundation for a fair approach to cash compensation and it plays a vital role in fulfilling the requirement for equitable pay (Adamus 2015). The advantage of traditional narrow graded structures is that they ensure a significant control over the pay range for jobs of same size in the same job grade Stoskopf (2012). The pay range is controlled and it defines how much an employee on the job can earn. The structure of narrow grades ensures a comparably similar pay range for jobs in the same job size which supports the internal equity in a company (Milkovich 2014).

A possible solution is to use formal systems such as Hay job evaluation method. For the research hereof, the system of Hay job levels (or grades) was applied since all jobs in scope were already allocated in one of the Hay reference levels (or job grades). The methodology of Korn Ferry

(namely the Hay Guide-Chart Profile method of job evaluation, Bellak 1987) is one of the analytical tools for job evaluation that is being used globally (Schiels 2016, Skenes and Kleiner 2003, Steinberg 1992). Hay Guide-Chart Profile method is actually one of the most wide-spread analytical methods used across different industries by more than 8 thousand companies, mainly in the commercial sector (Korn Ferry 2017). When developing their methodology, Hay Group have observed a large number of companies and jobs. They noticed that even though there are many factors that could be used for job evaluation, there are three factors that are important to consider for each job. These three factors are know-how required to do the job, the way of thinking for solving problems that each job is facing and the job accountabilities (Skenese 2003). The Hay Guide Chart Profile Method“ (Bellak 1987) is an analytical system where each job is analysed considering three criteria. The methodology is based on evaluation of three different groups of parameters for each job:

1. Know-how - Technical Know-How - Management Breadth - Human Relation Skills
2. Problem Solving - Thinking Challenge - Thinking Environment
3. Accountability - Freedom to Act - Area of Impact Nature of Impact

The method is based on the assumption that all jobs must contribute to the achievement of goals which is defined as the job accountability. To fulfill this accountability, an employee must apply certain type and level of know-how, skills and experience. Further these inputs are used for analysis, assessment, argumentation and conclusions when solving problems. These three elements split into specific parts are common to all jobs and cover all factors regardless of the job content. These elements are derived from a solid research and experience with job attributes. The numeric scales (known as the “guide charts”) are used to determine the decisive score on each of the elements and the final sum of values is the actual job evaluation result. This determines the job profile relative to other jobs. The split of the total value between the know-how, problem solving and accountability gives an overview of the job characteristics, or the job profile. Chaneta (2014) Evaluation of each parameter is performed against a defined scale. Each parameter gets a separate point score and at the end the total points score is summed up. The total points score defines the size of a job. For the practical application in human resources management pre-defined ranges of Hay points determine the size of job using so called job grade or job level. All jobs allocated to the same job level are comparable across the industries and are considered to be of equal complexity, responsibility and demand even though the job content may differ. All jobs evaluated using such methodology allow for relevant comparisons within one company or across multiple companies.

Not surprisingly, when the Korn Ferry Group controlled for the Hay grade system in its gender pay gap calculation recently for OECD countries it came to the conclusion that the gap is almost non-existent, dropping to negligible 1,6% from raw gap of 17,6%. We estimate the gender pay gap for the case of the Czech Republic using unique firm-level data source. Our sample consists of 42 companies with 32 553 employees. The choice of companies reflects the actual composition of companies in respective commercial industry sectors in the Czech Republic. The number of companies in each sector and the corresponding number of individual salaries is shown below:

Table 1: Sample of companies

Industry Sector	Number of companies	Number of salaries (employees)
Finance	11	9 317
Energy	4	5 198
FMCG	6	5 565
IT/Telco	3	1 977
Services	8	2 514
Production	10	7 982
Total	42	32 553

Source: Own research and calculation

However, we do not limit our analysis to an application of the grades on the gender pay gap estimation only. Our main goal is to assess equal pay at the firm level and ask if companies in the Czech Republic are allocating their resources effectively. What we want to address is the possible mismatch between equal pay and gender equality. If the unexplained gender pay gap is small when controlling for the job grade while the inequality is present then we should ask if GPG is a good measure for equal pay in general.

Results

We start the analysis with a simple calculation of GPG using annual base salary data of full time employees. Salary is denoted in Czech crowns. Obviously, the mean of the unadjusted gender pay gap is huge, being in line with Eurostat data as well – 21% (see above). However, the median gap is considerably smaller in comparison to officially reported data – only 9%. It seems that our sample has probably heavier tails in comparison to the OECD and Eurostat data.

Table 2: Unadjusted gender pay gap

Gender	N	mean	p50	GPG mean	GPG median
Female	14355	323420,2	271200	0,79	0,91
Male	18198	409654,8	297915,1		

Source: Own research and calculation

Taking a closer look at the situation by deciles (focusing on mean salaries) reveals that sample has a heavy upper tail. The ratio of men to women in high-paid jobs is higher and the gap is also widening. This reflects a possible “glass ceiling” problem. It is worth to mention that the gap in the highest paid decile is just 12%; but, because of the low share of women it is affecting the overall gap, pushing it up dramatically. Calculating the gap by deciles and weighting it by the share of women in the particular decile on total population, we get an overall weighted GPG of less than 1%, which is rather negligible.

Table 3: Unadjusted gender pay gap by deciles and female to male ratio

decile	Number F	mean F	Number M	mean M	ratio F/M	GPG
1	1917	156056,1	1341	154158,9	1,430	1,012
2	1697	188229,4	1571	189902,2	1,080	0,991
3	1567	212462,9	1678	213197	0,934	0,997
4	1398	238091,9	1853	237671,4	0,754	1,002
5	1131	270401,5	2124	271001,8	0,532	0,998
6	1627	305052,3	1674	304192,1	0,972	1,003
7	1530	351445,2	1681	351954,4	0,910	0,999
8	1510	420261,5	1768	419993,4	0,854	1,001
9	1168	539436,8	2063	549034,3	0,566	0,983
10	810	930640,5	2445	1063402	0,331	0,875
Total	14355	323420,2	18198	409654,8	0,789	0,789

Source: Own research and calculation

In the next step, we apply the job grade method to dig further into the gender pay gap and especially its unexplained part. Having grades from 5-24 we get

Table 4: Gender pay gap adjusted by job grade

Job Grade	Employees		mean M	ratio F/M	GPG mean	GPG median
	total	mean F				
5	52	192712,9	160156,9	0,73	1,2	1,51

6	265	136416	131912,6	0,01	1,03	1,01
7	469	155748	193805,7	1,63	0,8	0,67
8	2647	178195,7	189866	1,04	0,94	0,91
9	3456	182235,5	200524,1	0,88	0,91	0,90
10	3257	217500,6	250076,1	0,47	0,87	0,83
11	3339	225504,6	244172,9	0,84	0,92	0,90
12	4102	271357,1	277614,2	1,27	0,98	0,97
13	2674	318699,3	328138	1,33	0,97	0,97
14	3649	371604,2	378576,8	1,02	0,98	0,99
15	3772	453841,4	475820,9	0,66	0,95	0,96
16	2325	607963,7	630751,7	0,46	0,96	0,98
17	1448	767437,3	824710	0,37	0,93	0,93
18	734	1069834	1184220	0,24	0,90	0,95
19	232	1488157	1571487	0,25	0,95	1,00
20	73	1832010	1916695	0,2	0,96	1,02
21	42	2056943	2657408	0,2	0,77	0,83
22	12	2760000	3153662	0,09	0,88	0,91
23	3	0	3805600	0	N/A	N/A
24	2	0	4196838	0	N/A	N/A

Source: Own research and calculation

It looks that, similar to the decile decomposition, application of job grades tends to shrink the gender pay gap substantially. In comparison to decile decomposition, we see higher gaps for certain job grades however. Obviously the 5th grade (lowest job grade) favours women to men, while the 7th grade is exactly opposite. Nevertheless, these grades do not represent strong groups

of employees and will not seriously affect the overall GPG. Regarding the highest grades that are associated with highest salaries, we see a higher gap for grades 21 and 22. Again, the group is rather small so it will not affect the weighted gap much. Nevertheless, in line with previous results we may confirm the existence of the “glass ceiling” – from the 15th grade the share of women is decreasing rapidly again. The overall weighted mean gap is 6%, higher than the unadjusted gap based on deciles but not as dramatic in comparison to officially published one. So far, we dealt with whole sample but we should better analyse the gap on the firm level, because of possibly a great influence of horizontal segregation and other firm-specific factors, as mentioned in the section above. Figure 1 contains the results; the firm-level gap is the average of gaps by specific grades weighted by the share of women in those grades.

Obviously, the gender pay gap is quite small for almost all firms in our sample. Overall, the gap weighted by relative size of job grade in each company is 3,4% for the median and mean gap as well. This is almost perfectly in line with results of Korn Ferry/Hay Group (2016), that estimated the gap for the case of the Czech Republic to be 3,8%. As indicated above, our purpose is not only to assess the gender pay gap per se but also (and mainly) to answer the question if gender pay gap is reflecting well the concept of equal pay in general. Equality (or inequality) can be measured by several methods. For simplicity, we choose to use an indicator of max/min ratio in our study. If employees are paid equally with respect to their position and skills, the maximum and minimum difference should be in an interval from (-20 %) to (+20%) from mean, meaning the max/min ratio should not exceed 1,5 within the job grades (Mondy 2014, Milkovich 2014, Armstrong 2007). This is in line with the ideas of responsible leadership (Kempster 2016). Moreover, the gender pay gap should mimic the equality indicator - if there is a relatively big inequality, resulting in high max/min ratio of salaries among subjects within the same job grade, the GPG should be relatively higher too. We calculate the max/min indicator as a weighted average on a company level again. Weights are calculated as a division of the number of employees in a job grade by the total number of employees in a respective company. We may assume that companies with a weighted max/min indicator below 1,5 tend to follow the equality and responsible leadership principles while companies with a considerably higher indicator do not (and the higher the worse). Figure 2 shows the results of max/min ratio in companies.

We can see that the max/min ratio usually exceeds the “responsible” value 1,5. That indicates inequality within the job grades. However, as the gender pay gap is not high within the grades we may assume that the gender pay gap is probably not a valid indicator of equality in terms “equal pay for equal work”. Correlating the gender pay gap with max/min ratio yields an inconclusive result of -0,13 – there is no correlation between these two indicators. To support our findings, we run an OLS regression with robust standard errors (to deal with possible heteroskedasticity) when controlling for size of the company, type of industry and share of women. The estimated equation is

$$mr = b_0 + b_1(gpg) + b_2(size) + b_3(fshare) + \sum_{i=1}^6 b_{4i} (ind)_i + \varepsilon \quad (1)$$

where *mr* stands for job grade adjusted max/min ratio, *gpg* stands for job grade adjusted gender pay gap, *ind* is a dummy variable of industry (6 types of industries are in the sample – Energetics, Finance, IT & Telecommunications, Services, Manufacturing and FMCG) and *fshare* is the share of women in a particular company and is the error term. Table (6) shows estimated results (ITTelco was omitted due to perfect collinearity).

Table 5: Put Equation (1) robust OLS estimate

explanatory variables	Coefficient	SE
gpg (b1)	-1,249	(-0.88)
Size (b2)	0.0003***	(3.87)
Fshare (b3)	-1,256	(-1.39)
ind1 (Finance – b41)	-1,012	(-1.23)
ind2 (Services – b42)	-1,215	(-1.54)
ind3 (Manufacturing – b43)	-2.006**	(-2.81)
ind4 (FMCG – b44)	-1,526	(-1.69)
ind5 (Energetics- b45)	-1.558*	(-2.16)
ind6 (ITTelco – b46)	omitted	(.)
Constant (b0)	5.176**	(3.31)
Observations	42	
R-sq	0,543	
adj.R-sq	0,432	
AIC	87,65	

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

The goodness of fit of the model is quite reasonable ($R^2=0,54$), residuals are normally distributed and robust so we may treat the estimate as reliable. It is quite obvious that the regression analysis supports our previous doubts. The gender pay gap is statistically insignificant (although negative as expected); hence we cannot say it is a good predictor of equal pay in terms “equal pay for equal job”. We also see significance in the size of the company – the bigger the company the higher inequality may be expected. This is quite disturbing as one would expect lower inequality due to HR departments present in bigger companies and higher focus on “responsible leadership” in these companies. Our findings bring serious doubts regarding responsible leadership and proper human resource management of the representative companies in the Czech Republic. And

although the gender pay gap, when properly calculated, seems considerably small, it does not reflect the true inequality at all.

Conclusion

Equal pay for equal work has become a highly discussed topic in recent decades. Today the discussion is focused mainly on the gender pay gap, although the equal pay issue is wider. Nevertheless, the gender pay gap has become a flagship of equal pay and has become the main indicator for measuring equal pay in companies and national economies alike. Moreover, gender pay gap has become a serious social and political issue as well.

Besides standard legislation acts against discrimination on labour market, many policy makers today deal with the idea of women quotas or similar measures to decrease the gap between men and women. Such policy is backed by quite simplified indicators or analyses, however. Using an unadjusted ratio of mean values of male and female salaries is of course the simplest one. This indicator often shows huge differences between men's women's salaries in many developed countries. For the case of the Czech Republic which our article deals with, the unadjusted gap was about 22,5% in 2015. In contrast to political representatives and various interest groups (like promoters of Equal Pay Day), researchers are trying to use different, more statistically correct, indicators and also explain the origins of gender pay gap.

Regarding the origins of the gap there is a vast amount of studies and research papers dealing with this issue. It seems that two types of segregation are behind the gap – vertical and horizontal segregation. Vertical segregation means a lower ratio of women in leading positions (“glass ceiling”) or on the contrary a high ratio of women in low paid positions (“sticky floor”). There are many possible explanations of vertical segregation from discrimination issues to part time job preference, lower bargaining ability of women or their higher risk-taking aversion. Nevertheless, it must be stressed that vertical segregation is diminishing in time for the case of developed countries.

Horizontal segregation is related to imbalance in share of men and women among different industries (called often “glass door”). There are industries dominated by men (like information technologies or manufacturing) and dominated by women (like education or healthcare), when men's industries tend to have generally higher earnings. Recent studies show that horizontal segregation does more than a half of total gap and does not seem to vanish in time. Dealing with horizontal segregation is rather difficult because it is likely to be related to education and natural preferences that are mostly different for men and women. Nevertheless, it seems that rising earnings in women-dominated industries would probably help to close the gap at least in the short run. In the long run, the horizontal segregation would diminish if more women would be attracted to studies of engineering, science, manufacturing or construction. Researchers constantly try to decompose the gender pay gap by adding explanatory variables – the gap is then divided into explained and unexplained component, where the unexplained part is often linked with discrimination. The Oaxaca-Blinder decomposition has been used in the last decades extensively and remains the main decomposition method even today. Results often point to a high share of unexplained gap, leading sometimes to discrimination conclusions. Nevertheless, this method is possibly flawed as it works with very limited scale of explanatory variables and does not compare comparable individuals. In recent decades, researchers have focused on other methods to fill this

gap, mainly utilizing matching techniques or utilizing job grades. These methods lead to substantial reduction of gender pay gap.

In our article we use firm-level data from 42 Czech companies, totalling 32 553 employees. Simple mean gender pay gap is 21%, close to the officially reported one. However, using decile decomposition and job grades we conclude that the gap has been reduced substantially to almost negligible values (1% in the case of decile decomposition and 3,4% for the case of firm-level job grades). This is in line with several contemporary studies and raises doubts regarding political proclamations about women's workplace discrimination. On the other hand, we find a higher gap for higher deciles or grades, which supports the idea of a "glass ceiling" existing among Czech companies.

Our second and possibly more important task was to test the suitability of gender pay gap as an indicator of equal pay in the general sense of "equal pay for equal job". Implicitly, we test for the responsible leadership and effective human resources management of the Czech companies as well. As companies that implement responsible leadership should pay in interval from 80%-120% of the average salary for the same job. Using a simple weighted max/min ratio, we may assume the company follows responsible leadership if this ratio is not higher than 1,5 (1,0 means perfectly equal when maximum equals minimum). We found out that the vast majority of representative Czech companies are well above the 1,5 threshold. That means the companies do not follow responsible leadership and possibly do not allocate resources efficiently. Consequently, by comparing the maximum/minimum salary ratio (adjusted by company and job grade), and gender pay gap (adjusted the same way), we test the assumption that the gender pay gap is a suitable indicator of general pay equality. Surprisingly, the correlation between the gap and max/min ratio is rather weak or non-existent. These findings are supported by the regression analysis we performed controlling for other variables that may affect the inequality. The estimation output seems statistically reliable yielding no statistical relation between gender pay gap and equality measured by max/min ratio. In other words, it seems that employees in our sample doing the same job are not paid equally, regardless of their gender. Our findings are important especially because gender pay gap is today used as a common measurement of equal pay in a sense "equal pay for equal work". Although our findings could be biased by using only local (Czech) companies and should be backed by similar studies worldwide, we at least would like to initiate a debate as to if gender pay gap is really a suitable indicator of equal pay.

References

- Adams, J. S. (1965). Inequity in social exchange, in L.Berkowitz (ed.). *Advances in Experimental Social Psychology* (vol 2, pp. 267—299), New York Academic Press
- Adamus, W. (2015). A new method of job evaluation [online]. Jagellonian University, Poland. [vid. 2015-11-01]. <http://anale.feaa.uaic.ro/anale/resurse/41/S01/Adamus.pdf>
- Albrecht, J., Björklund, A. and Vroman, S. (2003). Is There a Glass Ceiling in Sweden? *Journal of Labor Economics*, 21 (1).
- Anderson, T., Forth, J., Metcalf, H. and Kirby, S. (2001). *The Gender Pay Gap: Report to the Women and Equality Unit*. London: Women and Equality Unit, DTI.
- Anker, R. (1998). *Gender and jobs : sex segregation of occupations in the world*. International Labour Office, Geneva.

- Armstrong, M. (2007). *A handbook of Employees Reward Management and Practise*. London: Kogan Page.
- Arulampalam, W., Booth, A. L. and Bryan, M. L. (2007). Is there a glass ceiling over Europe? Exploring the gender pay gap across the wage distribution. *ILR Review*, 60 (2).
- Atal, J., Nopo, H. and Winder, N. (2009). *New Century, Old Disparities: Gender and Ethnic Wage Gaps in Latin America*. IDB Working Papers, 109, 76.
- Bettio, F. and Verashchagina, A. (2009). *Gender segregation in the labour market: Root causes, implications and policy responses in the EU, Luxembourg: Publications Office of the European Union*.
- Becker, G. S. (1971). *The Economics of Discrimination, Second edition*. Chicago: University of Chicago Press.
- Becker, G. S. (1964). *Human Capital, 1st Edition*. New York: Columbia University Press.
- Bellak, A. O. (1987). *The Hay Guide Chart-profile Method of Job Evaluation*. Hay Group.
- Black, D. A., Haviland, A. M., Sanders, S. G. and Taylor, L. J. (2008). Gender Wage Disparities among the Highly Educated. *The Journal of Human Resources*, 43(3).
- Blau, F. D. and Kahn, L. M. (2000). Gender Differences in Pay. *Journal of Economic Perspectives*, 14 (4).
- Blau, F. D. and Kahn, L. M. (2016). *The Gender Wage Gap: Extent, Trends, and Explanations*. IZA DP No. 9656
- Blinder, A. (1973). Wage Discrimination: Reduced Form and Structural Estimates. *Journal of Human Resources* 8 (4).
- Boll, Ch., Leppin, J., Rossen, A. and Wolf, A. (2016). *Magnitude and Impact Factors of the Gender Pay Gap in EU Countries*. European Commission - Directorate-General for Justice, Publication Office of the European Union.
- Burk, M. (2013). *The New Mexico Pay Equity Initiative A template for narrowing the gender pay gap*. Washington, DC: U.S. Department for Labor.
- Caliendo, M., and Kopeinig, S. (2008). Some practical guidance for the implementation of propensity score matching. *Journal of Economic Surveys*, 22 (1).
- Chamberlain, A. (2016). *Demystifying the Gender Pay Gap. Evidence From Glassdoor Salary Data*. Glassdoor 2016.
- Chanavat, A. and Ramsden, K. (2014). *Climb to the Top—Tracking Gender Diversity on Corporate Boards*. New York: Thomson Reuters.
- Card, D., Cardoso, A. R. and Kline, P. (2016). Bargaining, Sorting, and the Gender Wage Gap: Quantifying the Impact of Firms on the Relative Pay of Women. *The Quarterly Journal of Economics*, 131(2).
- Catalyst. (2013). *2013 Catalyst Census: FORTUNE 500 Women Board Directors*. New York: Catalyst.
- Edgeworth, F. Y. (1922). Equal Pay to Men and Women for Equal Work. *The Economic Journal*, 32 (128).
- Fang, Z. and Sakellariou, C. (2011). A case of sticky floors: Gender wage differentials in Thailand. *Asian Economic Journal*, 25 (1).

- Freeman, R. and Medoff, J. (1984). *What do Unions do?* New York: Basic Books.
- Frost, B., Hazard, P. and Kimmins, D. (2016). *The real gap: fixing the gender pay divide*. Korn Ferry / Hay Group.
- Goldin, C. (2014). A Grand Gender Convergence: Its Last Chapter. *American Economic Review* 104 (4).
- Gunderson, M. (1989): Male-Female Wage Differentials and Policy Responses. *Journal of Economic Literature*, 27.
- Gunewardena, D., Abeyrathna, D., Ellagala, A., Rajakaruna, K. and Rajedran, S. (2008). Glass ceilings, sticky floors or sticky doors? A quantile regression approach to exploring gender wage gaps in Sri Lanka. Poverty and Economic Policy Research Network Working Paper 04-2008.
- Heckman, J. (1979). Sample Selection Bias as a Specification Error. *Econometrica*, 47.
- Hedija, V. and Musil, P. (2011). Gender Pay Gap – Application in the Specific Enterprise. *Review of Economic Perspectives*, 11 (4).
- Hernández, P. and Méndez, I. (2005). La corrección del sesgo de selección en los análisis de corte transversal de discriminación salarial por sexo: estudio comparativo en los países de la Unión Europea. *Estadística Española*, 47 (158).
- Hirsch, B., König, M. and Möller, J. (2013). Is there a gap in the gap? Regional differences in the gender pay gap. *Scottish Journal of Political Economy*, 60.
- Chaneta, I. (2014). Effects of Job Evaluation on Decisions Involving Pay Equity. *Asian Social Science*, vol. 10, no. 4.
- Jašová, E. and Kadeřábková, B.. "Analysis of Effects of Reconciliation of Family and Work Life of Women Through the Prism of Non-accelerating Inflation Rate of Unemployment in the Czech Republic." *Politická Ekonomie* 67 (2019): 316-332.
- Jasova, E., Kaderabkova, B. (2021). Ambiguous effects of minimum wage tool of labour markets regulation – key study of V4 countries. *International Journal of Economic Sciences*, Vol. X(2), pp. 59-86. , DOI: 10.52950/ES.2021.10.2.004
- Jurajda, S. (2005). Gender Segregation and Wage Gap: An East-West Comparison. *Journal of the European Economic Association*, 3 (2-3).
- Kempster, S., Carroll, B. (2016). *Responsible Leadership: Realism and Romanticism*. New York: Routledge.
- Korn Ferry (2017), www.haygroup.com
- Lawter, L., Rua, T. and Andreassi, J. K. (2016). The Gender Pay Gap and Self- Employment in the United States. *New England Journal of Entrepreneurship*, 19 (1)
- Le, A.T., Miller, P.W., Slutske, W.S. and Martin, N. G. (2011). Attitudes towards economic risk and the gender pay gap. *Labour economics*, 18.
- Lechner, M. (1999). Earnings and Employment Effects of Continuous Off-the-Job Training in East Germany after Unification. *Journal of Business Economic Statistics*, 17 (1).
- Lewis, H. G. (1986). Union Relative Wage Effects. *Handbook of Labor Economics*(1st edition), Vol. 2, Ch. 20., Ashenfelter O., Layard R. (eds.), Elsevier Science Publisher.

- Mathis, R. L., Jackson, J. H. (1997). Human resource management (8th ed.). Minneapolis/St. Paul, MN: West Publishing.
- Meyersson Milgrom, E. M., Petersen, T. and Snartland, V. (2001). Equal Pay for Equal Work? Evidence from Sweden and a Comparison with Norway and the U.S. *The Scandinavian Journal of Economics*, 103 (4).
- Milkovich, G., Newman, J. and Gerhat B. (2014). "Compensation", 11th edition. New York: McGraw Hill.
- Mincer, J. and Polachek, S. W. (1974). Family Investment in Human Capital: Earnings of Women. *Journal of Political Economy*, 82 (2).
- Mondy R., W., & Mondy B., J. (2014). Human Resource Management, 13th edition, Essex: Pearson Education Limited.
- Mysíková, M. (2012). Gender Wage Gap in the Czech Republic and Central European Countries. *Prague Economic Papers*, 3.
- Nopo, H. (2008). Matching as a tool to decompose wage gaps. *Review of Economics and Statistics* 90 (2).
- Oaxaca, R. (1973). Male-Female Wage Differences in Urban Labor Markets. *International Economic Review*, 14 (3).
- OECD Education at Glance, OECD 2016.
- Plantenga, J. and Fransen, E. (2010). The extent and origin of the gender pay gap in Europe. In: Chant, Silvia, The international Handbook of Gender and Poverty: Concepts, Research, Policy. Cheltenham: Edward Elgar Publishing Limited.
- Polachek, S. W. and Xiang, J. (2014). The Gender Pay Gap Across Countries: A Human Capital Approach. IZA DP No. 8603
- Polachek, S. W. (1981). Occupational Self-Selection: A Human Capital Approach to Sex Differences in Occupational Structure. *Review of Economics and Statistics*, 63.
- Riach, P. and Rich, J. (2002). Field experiments of discrimination in the market place. *The Economic Journal*, 112.
- Rosenbaum, P. R., and Rubin, D. B. (1983). The central role of the propensity score in observational studies for causal effects. *Biometrika*, 70(1).
- Sakellariou, C. (2004). The use of quantile regressions in estimating gender wage differentials: a case study of the Philippines. *Applied Economics*, 36(9).
- Shackleton, J. (2008). Should We Mind the Gap? Gender Pay Differentials and Public Policy. The Institute for Economic Affairs.
- Schildts, J. (2016). Managing Employee Performance & Reward, 2nd edition, Cambridge: Cambridge Press
- Skenes, C., Kleiner B., H., (2003) The Hay System of Compensation, Management Research News, vol. 26, pp. 109-115.
- Steinberg, R., J. (1992). Cultural Lag and Gender Bias in the Hay System of Job Evaluation, *Sage Journal* 1992 Volume: 19 issue: pp. 387-423

- Stoskopf, G. A. (2002). Choosing the Best Salary Structure for Your Organization. *Worldat Work Journal* 11, no. 4, 28–36.
- Tenjo, J., Ribero R. and Bernat, L. (2002). Evolución de las diferencias salariales por sexo en seis países de América Latina. Colección Documentos de Economía 1, 59.