Boll, Christina; Lagemann, Andreas

Working Paper

The gender pay gap in the public and private sector in Germany - magnitude, evolution 2010-2014 and main drivers

HWWI Research Paper, No. 183

Provided in Cooperation with:
Hamburg Institute of International Economics (HWWI)

Suggested Citation: Boll, Christina; Lagemann, Andreas (2018) : The gender pay gap in the public and private sector in Germany - magnitude, evolution 2010-2014 and main drivers, HWWI Research Paper, No. 183, Hamburgisches WeltWirtschaftsInstitut (HWWI), Hamburg

This Version is available at:
https://hdl.handle.net/10419/182106

Hamburg Institute
of International
Economics

The gender pay gap in the public and private sector in Germany – magnitude, evolution 2010-2014 and main drivers

Christina Boll, Andreas Lagemann

HWWI Research
Paper 183

Hamburg Institute of International Economics (HWWI) | 2018
ISSN 1861-504X

Corresponding author:
Christina Boll
Hamburg Institute of International Economics (HWWI)
Oberhafenstr. 1 | 20097 Hamburg, Germany
Telephone: +49 (0)40 340576-668 | Fax: +49 (0)40 340576-150
boll@hwwi.org

HWWI Research Paper
Hamburg Institute of International Economics (HWWI)
Oberhafenstr. 1 | 20097 Hamburg, Germany
Telephone: +49 (0)40 340576-0 | Fax: +49 (0)40 340576-150
info@hwwi.org | www.hwwi.org
ISSN 1861-504X

The gender pay gap in the public and private sector in Germany – magnitude, evolution 2010-2014 and main drivers

Christina Boll, Andreas Lagemann

This study is an outcome of a research project that had been funded by the Federal Ministry for Family Affairs, Senior Citizens, Women and Youth (BMFSFJ). We are grateful to Teresa Wittgenstein who provided excellent research assistance. The full content of the study, any omissions and views expressed therein are in the sole responsibility of the authors.

Abstract

The present study examines, based on the Structure of Earnings Survey (SES) 2010 and 2014, the unadjusted gender pay gap of the public sector (economic sectors O (Public Administration, Defence, and compulsory Social Security) and P (Education)) compared to the private economy. The unadjusted gender pay gap in the public sector stood at 5.6 % in 2014 and was virtually unchanged compared to 2010. The gap in the private economy remained about four times as high. The wage advantage of women over men among part-time workers, both in the public and in the private sector, is due to the relatively high proportion of marginally and temporarily employed workers and the relatively short firm tenure among men. Among full-time workers, the explained part of the gap is driven by the performance group. The findings once again underline the need to review gender-based access to leading positions in the public sector. The detailed decomposition of the explained part for all workers reveals that the advantageous distribution of performance groups and levels of education, as well as the lower rate of part-time employment among men, explains their earnings advantage. In the private economy, men also benefit from their employment in wage-attractive sectors.

Content

1 Introduction **4**

2 Data and Methodology **4**

2.1 Data 4

2.2 Methodology 7

3 Results **9**

3.1 The Unadjusted Gender Pay Gap in the Public and in the Private Sector 9

3.1.1 Unadjusted Gender Pay Gap in Total Employment 9

3.1.2 Unadjusted Gender Pay Gap among Part-Time vs. Full-Time Workers 11

3.1.3 Unadjusted Gender Pay Gap among Civil Servants vs. Employees 13

3.1.4 Unadjusted Gender Pay Gap in East vs. West Germany 15

3.1.5 Unadjusted Gender Pay Gap by Performance Groups 18

3.2 Decomposition of the Gender Pay Gap: Explained vs. Unexplained Part 21

3.2.1 Explained and Unexplained Part of the Gender Pay Gap in Total Employment 21

3.2.2 Explained and Unexplained Part of the Gender Pay Gap Among Full- vs. Part-Time Workers 23

3.2.3 Explained and Unexplained Part of the Gender Pay Gap Among Civil Servants vs. Employees 25

3.2.4 Explained and Unexplained Part of the Gender Pay Gap in East vs. West Germany 26

3.2.5 Explained and Unexplained Part of the Gender Pay Gap by Performance Group 27

3.3 Single Components of the Explained Part of the Gender Pay Gap 28

4 Summary **29**

References **32**

Appendix **33**

1 Introduction

According to the Federal Statistical Office (2018), the German gender pay gap in wages in the public sector lies with 9 % clearly beneath the pay gap in the private economy (23 %). The question what accounts for this observed gender pay gap in the public sector nonetheless arises. If the public sector should take a pioneering role in the reduction of wage inequality in Germany, a detailed analysis with up-to-date data is required in order to identify the current causes of the pay gap.

Studies for the public sector generally encompass the two sectoral divisions of the economy P (Education) and O (Public Administration, Defence, and Compulsory Social Security). To our knowledge, the most current study on the gender pay gap in the public vs. private sector on the basis of official data is based on data from the years 2007 and 2008 (BMFSFJ 2009). The study calculated – based on the Statistics of the Public Service Personnel (*Personalstandstatistik für den öffentlichen Dienst*) as well as on data of the Quarterly Earnings Survey (*Vierteljährliche Verdiensterhebung*) – the unadjusted gender pay gap in the named two divisions of the public sector in comparison to the private economy. The calculations have been carried out for different subgroups of workers, e.g. employees vs. civil servants, as well as for different performance groups (*Leistungsgruppe*n). However, the aggregate data did not allow decomposing the unadjusted gender pay gap. Therefore, it was not possible to specify the adjusted gap which comprises the remaining gap between women and men with similar characteristics.

The present study closes this research gap. It provides an analysis of the pay gap between women and men in the economic sectors O and P compared with the private economy, based on microdata of the 2010 and 2014 Structure of Earnings Survey.

2 Data and Methodology

2.1 Data

Our dataset consists of the waves 2010 and 2014 of the Structure of Earnings Survey (SES, *Verdienststrukturerhebung*). In the SES, information on firms and workers can be linked such that gender pay gaps can be calculated and examined with regard to worker- and firm-specific characteristics. The worker dataset encompasses personal information (gender, age, education), job-related information (social security classification code, occupational status, performance group, working hours, firm tenure) and information pertaining to earnings (gross-, net earnings, shift/ night allowance, special payments, payroll tax, social security contributions, collective agreement if applicable). The firm dataset provides information on the size of the enterprise, the public sector influence, as well as the economic sector, among other things. The SES 2010 consists of around 1.9 million worker records from more than 32,000 companies. The SES 2014 comprises around 71,000 companies and 1.03 million worker records.

Sample

In order to conduct a comparison between the years 2010 and 2014, firms belonging to the economic sector A "Agriculture, Forestry, Fishery", smallest firms with less than ten workers subject to social insurance contributions, as well as private educational institutions were excluded. This procedure accords with the one of the Federal Statistical Office (2010). Thereby sector O (Public Administration, Defence, and Compulsory Social Security) and sector P (Education) together are referred to as the public sector. Furthermore, workers in partial retirement, apprentices as well as trainees are removed from the sample. With these restrictions, the dataset underlying this study includes 2,560,795 workers (2010: 1,723,782; 2014: 837,013).

Target Variable

Gross hourly earnings[1] (EF48) are calculated as gross monthly earnings including shift/ night allowances divided by paid working hours, including paid overtime. One off payments such as Christmas bonuses, holiday pay etc. are not taken into account, analogous to the procedure of the Federal Statistical Office (2010). In the earnings equations, the log gross hourly wage will be used as the dependent variable.

Explanatory Variables

From the *worker data set*, a number of individual characteristics are included in the calculations. The variable occupation comprises nine main occupational groups according to the ISCO 2008 classification (generated on the basis of the variable EF42). Occupational information is not available for the year 2010 for sector O. The educational level is divided into three groups according to the ISCED 2011 classification (EF43) (low: ISCED 0-2, medium: ISCED 3-4, high: ISCED 5+). The working time is classified into three categories, which differentiate between full-time, part-time up to less than 60 % (small-scale part-time) and part-time from 60 % to less than 100 % (large-scale part-time) of the usual weekly working hours within the firm (EF52). In order to capture the different job requirement levels, workers (except for marginally employed workers) are subdivided into five performance groups (EF9): Workers in managerial positions, workers in senior positions, skilled workers, semi-skilled workers, unskilled workers. The potential employment experience results from the age (EF41) of the person minus the years of schooling (EF16u2) and 6 years for the time before school entry. Since a curvilinear relationship can be assumed, the squared term of potential employment experience is also included. In addition, firm tenure in years (EF40) as well as dummy variables for civil servants (opposed to employees[2], EF16u1), workers with fixed-term contracts (EF17), payment of supplements (EF23) and marginally employed workers (EF17) are incorporated into the model.

From the *firm data set*, information about the federal state (EF5), the economic sector (EF6, summarized to 16 sectors) and the firm size are added. The firm size (EF10) is divided into three categories (less than 50, 50 to under 250, 250 and more workers). For sector O, this characteristic is not reported for any firm, for sector P only for a few. We also generate a dummy variable for public sector influence (EF9; prevailing vs. no or limited influence).

---

[1] The terms „earnings“ and „wages“ are synonymously used in this study.

[2] The term “employee” is used exclusively for salaried employees subject to collective agreements in this study. Employed persons are more generally termed ‘workers’. Hence, workers comprise civil servants and employees.

The different variable specifications in terms of occupation and firm size between sectors and years slightly limit the cross-sectoral and cross-time comparability of the decomposition results (see Chapter 3). However, disregarding the information would have meant a significant loss of information for the private economy, for which this information is available for both years.

Table 1:

Availability of the Features Firm Size and Occupation (ISCO) in the VSE 2010 and 2014

	Sector O Public Administration, Defence, and Compulsory Social Security		Sector P Education	
Jahr	2010	2014	2010	2014
Firm size	missing	missing	Available for few firms only	Available for few firms only
ISCO	missing	avaiable	available	available

Delineation of the model specification in this study compared to previous studies

For methodological reasons, the results of this study on the gender pay gap deviate not only from the results of the 2009 BMFSFJ study (based on aggregated data), but also from the results of the Federal Statistical Office.[3]

In the BMFSFJ study (2009), as already mentioned above, the Quarterly Earnings Survey (*VVE*) was used in addition to the Statistics of the Public Service Personnel (*Personalstandstatistik für den öffentlichen Dienst*); the individual data of the latter was integrated into the VVE with the help of an estimation model in order to obtain comparable wage data for the public as well as the private sector. For the VVE, however, there is no individual wage data but only aggregated data available (see ibid, p. 9). Accordingly, only average earnings based on all paid hours were reported; persons working for many hours (full-time workers) influenced the result more than persons with fewer hours of work (marginally employed). Since the mean deviation of the individual from the average hourly earnings is lower for women than for men due to women's lower wage dispersion, the use of individual rather than average values leads to a comparatively higher gender pay gap (see also BMFSFJ 2009, p. 10). In addition to trainees and workers in partial retirement, who are also excluded in our study, the study of the BMFSFJ (2009) additionally disregards the marginally employed. As marginal employment plays a greater role in the private sector (especially for female earnings) than in the public sector, the gender pay gap for the private sector is underestimated in the BMFSFJ study (2009) (BMFSFJ 2009, p. 10). The share of the marginally employed in the private sector was roughly 10 % in 2010 as well as 2014, whereas in the public sector it declined from 8 % to almost 6 %. However, while the

[3] For a systematic analysis of methodological differences and their implications for the magnitude of the gender pay gap see Boll/Leppin (2015), p. 251.

employment shares were quite similar among men and women in the public sector, the proportion of marginally employed among women was much higher at 15 % than among men (7 %) in the private sector.

Since 2006, the last microdata-based calculation, the official gender pay gap statistics of the Federal Statistical Office are based on updates of the Quarterly Earnings Survey. In the calculation of the macroeconomic wage gap, only sector O, but not sector P, is excluded. As the wage gap in both sectors is below average compared to the economy as a whole, the Federal Statistical Office calculates lower values for the pay gap for the economy as a whole than we find for the private sector as the comparative category in our study (sectors O and P excluded). Furthermore, contrary to the approach of the Federal Statistical Office (2010, p. 6), this study excludes workers in partial retirement as well as apprentices and trainees. As in our calculations, the Federal Statistical Office also excludes very small enterprises with fewer than ten workers.

2.2 Methodology

In the first step, the gross hourly wage rate is estimated separately for men and women, using the explanatory variables presented in Section 2.1 in an ordinary least squares wage regression model (OLS).

$$\ln W_{m;i} = \beta_m^0 + \sum_j \beta_m^j X_{m;i}^j + \varepsilon_{m;i}$$

$$\ln W_{f;i} = \beta_f^0 + \sum_j \beta_f^j X_{f;i}^j + \varepsilon_{f;i}$$

$W_{m;i}$ denotes the male gross hourly wage rate and $W_{f;i}$ the female one, $X_{m;i}^j$ ($X_{w;i}^j$) denominate the j-observable exogenous individual values of characteristics of men (women) including a constant β_m^0 (β_f^0) for men (women), β_m^j (β_f^j) depict the desired coefficient of parameter j for men (women) and ε is an error term that meets the requirements of a linear regression model.

The method applied by the Federal Statistical Office (Blinder 1973 and Oaxaca 1973) is used both for the calculation of the unadjusted gender pay gap as well as for its decomposition. The Federal Statistical Office strives for maximum international comparability and therefore adheres to the uniform specifications of Eurostat (see Federal Statistical Office 2010, p.5).

The gender pay gap (GPG) corresponds to the mean unadjusted pay differential between men and women. It is taken as the difference between the logarithmic average gross hourly wages of men and women, which can be interpreted approximately as a percentage difference of the average gross hourly wages of men and women with the average gross hourly wage of men as a reference:

$$\mathrm{GPG} \quad = \overline{\ln W_m} - \overline{lnW_f}$$

In doing so, $\overline{W_m}$ denotes the average gross hourly wage of men and $\overline{W_f}$ that of women. We use logarithmized gross wages in order to provide the necessary comparability between the unadjusted and the adjusted gender pay gap.

Building on this, the pay gap between men and women is decomposed into an explained part (endowment effect) and an unexplained part of the gap (adjusted pay gap). Formally, this decomposition looks like the following (see Federal Statistical Office 2010):

$$\overline{\ln W_m} - \overline{lnW_f} = \sum_j \left(\overline{X_m^j} - \overline{X_f^j}\right)\beta_m^j + \sum_j \left(\beta_m^j - \beta_f^j\right)\overline{X_f^j} + \left(\beta_m^0 - \beta_f^0\right)$$

$\overline{X_m^j}$ and $\overline{X_w^j}$ represent the average characteristics of men and women respectively, while β_m^j and β_f^j form the estimated coefficients from the separate wage regressions for men and women. The first term on the right side of the equation indicates the endowment effect, the second and third terms together comprise the adjusted wage gap. The second term on the right side of the equation sums up the evaluation effects of all observable characteristics other than gender and the third term denotes the gender evaluation effect.

The evaluation effect comprises of the part of the pay gap that arises from gender specific returns to (a vector of) given characteristics (X_j), taking women's characteristics (X_f^j) as a reference. The endowment effect refers to the part of the gap that arises from gender-specific characteristics, evaluated with men's returns (β_m^j). The returns refer to the coefficients and the characteristics to the independent variables of the underlying wage regressions, respectively.

The endowment effect is due to different characteristics of women and men. Examples of different gender specific features are different weekly working hours, sectors or years of work experience. Another feature is the distribution of women and men in leadership positions. From the latter feature, it is particularly clear that discrimination can also exist regarding unequal access opportunities of men and women to the wage-relevant endowments. Therefore, the endowment effect may also contain discrimination; ignoring this would underestimate potential discrimination.

While the unadjusted pay gap looks at the pay gap between all (employed) men and women, the adjusted pay gap quantifies the pay gap between men and women with similar (observed) characteristics. The adjusted pay gap (often also called "unexplained pay gap", evaluation effect, or price effect) is also not to be equated with discrimination (Boll/Leppin 2015), as it is hardly possible in practical implementation to statistically consider all the structural features that contribute to the gender earnings differential. For example, actual employment experience which notably differs between women and men due to women's higher frequency of family-related labour market withdrawals, is not observed in the SES data. As a consequence, wage differences related to the gender difference in this endowment factor are included in the adjusted wage gap. Therefore, the unexplained part of the wage gap identified by the endowment effect can at best be understood as the upper limit of possible wage discrimination (see Federal Statistical Office 2010, S. 10).

3 Results

3.1 The Unadjusted Gender Pay Gap in the Public and in the Private Sector

The unadjusted gender pay gap is considered first in total employment and subsequently for different subgroups.

3.1.1 Unadjusted Gender Pay Gap in Total Employment

The unadjusted gender pay gap in the public sector of 5.6 % in 2014 was virtually unchanged compared to 2010. The gap in the private sector remained more than four times as high.

Overall, the gender pay gap for all workers increased only slightly in both sectors by +0.4 percentage points between 2010 and 2014 (see Chart 1). The pay gap in the public sector totaled 5.6 % in 2014. Compared to Q4 2008 (7.0 % according to BMFSFJ 2009) this is a slight reduction. However, due to the methodological differences, the values of the two studies are only partially comparable (see Chapter 2). In sector O (Public Administration, Defence, and Compulsory Social Security), the earnings gap in both 2010 and 2014 was 1.1 percentage points below that in sector P (Education).[4]

As shown in **Diagram 1**, the pay gaps in the public sector as a whole in both years 2010 and 2014 are lower than the respective values of the components O and P. This is due to the fact that in order to determine the pay gap in the public sector the gender structure of workers in Sectors O and P must be taken into account (see also the relevant argument in BMFSFJ 2009, p.15). Sector P is characterized by a higher level of earnings compared to Sector O as well as a particularly high proportion of female workers (see Table 3). 67.5 % (69.3 %) of women being employed in the public sector worked in sector P in 2014 (2010). In determining the overall public sector wage gap, the higher wage levels in Sector P are therefore much more significant for women than for men.

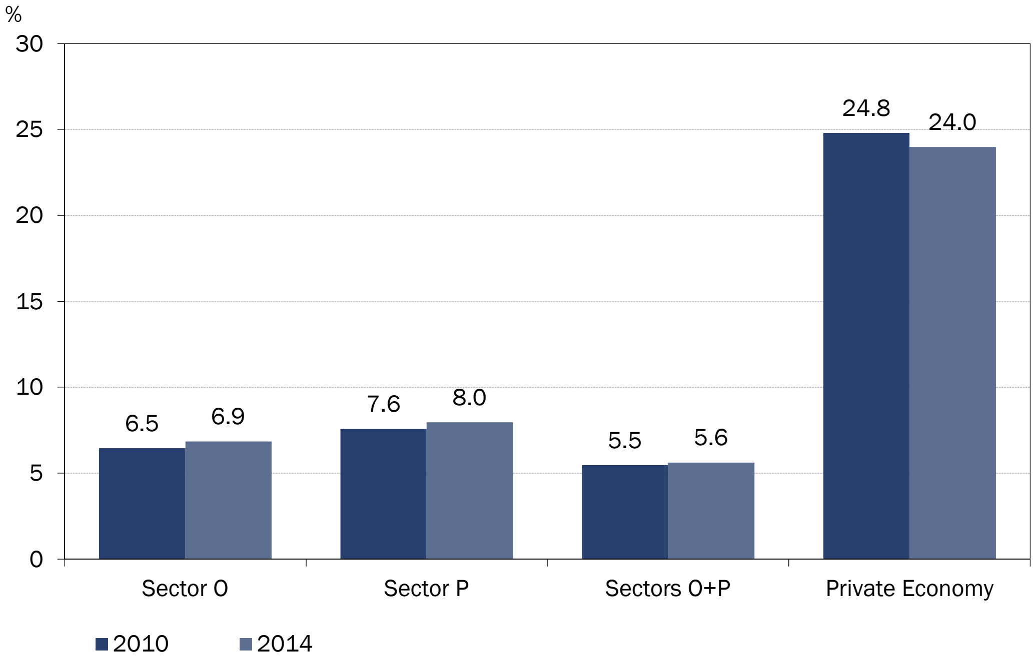
The residual category shown in Figure 1 includes the total economy excluding sectors O and P (hereafter referred to as 'private economy' or 'private sector' in this study). As in 2010, the gender pay gap was more than four times as high in the private sector, compared with the public sector.[5]

[4] A larger gap for Sector P compared to Sector O had already been identified in the 2009 BMFSFJ study. The difference between the gaps was however more pronounced at about 6 percentage points: for sector O, a wage gap of around 8-9 % was found for 2007/08, whereas for sector P, it was around 15 %.

[5] The value for the private sector is thus higher than the value of 22 % (see Destatis 2018), which the Federal Statistical Office determines for 2014 for the overall economy (excluding only sector O).

Diagram 1:

Unadjusted Gender Pay Gap in Total Employment by Sector, 2010 and 2014 (in %)



Sources: Research Data Center of the Federal and State Statistical Offices (*FDZ der Statistischen Ämter des Bundes und der Länder*), Structure of Earnings survey *(Verdienststrukturerhebung*) 2014, own calculations.

Table 2 illustrates the relationship shown in Figure 1 using hourly wages.

Tabelle 2:

Average Gross Hourly Wages by Sector and Gender, 2010 and 2014 (euros)

	Sector O Public Administration, Defence, and Compulsory Social Security	Secor P Education	Sectors O+P Public Sector	Private Economy
2010				
Men	17.75	19.28	18.19	16.59
Women	16.64	17.87	17.23	12.95
2014				
Men	19.39	21.36	19.97	17.99
Women	18.11	19.72	18.88	14.15

Sources: Research Data Center of the Federal and State Statistical Offices (*FDZ der Statistischen Ämter des Bundes und der Länder*), Structure of Earnings survey *(Verdienststrukturerhebung*) 2014, own calculations.

No clear relationship between the gender pay gap and the female employment share

In the internal differentiation of the public sector, a higher female employment share is related to a higher gender pay gap (see **Table 3**): In sector P, where women make up 67.5 % of the employed in 2014, the wage gap is slightly higher than in sector O (with a female employment share of 53.8 %). However, this pattern does not fit when comparing the public sector with the private economy, where the share of women in employment at around 43-44 % in both years is well below the respective share in the public sector of around 60 %, but the gender pay gap is significantly higher. Great caution is however warranted with such conclusions, given the large heterogeneity of the 'private sector' aggregate.[6]

Table 3:

Female Employment Shares by Sector, 2010 and 2014 (in %)

	Sector O	Sector P	Secors O+P	Private Economy
	Public Administration, Defence, Compulsory Social Security	Education	Public Sector	
2010	54.5	69.3	60.5	43.2
2014	53.8	67.5	59.4	43.8

Sources: Research Data Center of the Federal and State Statistical Offices (*FDZ der Statistischen Ämter des Bundes und der Länder*), Structure of Earnings survey *(Verdienststrukturerhebung*) 2014, own calculations.

3.1.2 Unadjusted Gender Pay Gap among Part-Time vs. Full-Time Workers

In part-time jobs, women's wages are higher than men's. This holds true both for the public and the private sector. In full-time jobs however, men have a lead over women in both parts of the economy. In the public sector, the gender wage gap among part-timers (to women's advantage) is much more pronounced than the wage gap among full-timers (to men's advantage).

As shown in **Diagram 2**, the pay gap between men and women is only for full-time workers to the detriment of women; within the group of part-time workers, women earn on average higher wages than men. This applies to both sectors of the public sector and also to the private economy, as well as for both years 2010 and 2014.[7] The reason for this may be different characteristics of men and women among part-time workers. Which characteristics actually drive the gender pay gap will be shown in the decomposition analysis (see Section 3.3 below).

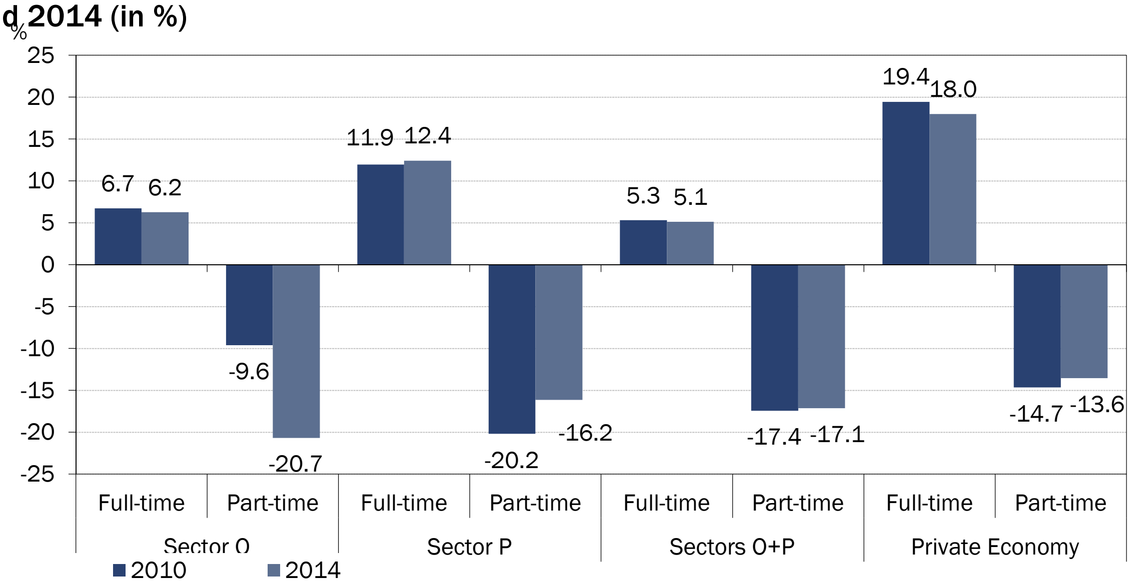
Table 4 illustrates the relationships on the basis of hourly wages. It also shows that women earn more on average, both full-time and part-time, in the public than in the private sector. The difference in pay between the two sectors is higher for women working part-time than full-time, and for the former it has even risen between 2010 and 2014. In 2014, the average wage of part-time employed women in the public sector stood at € 17.99 per hour, € 5.34 above the average wage of part-time employed women in the private economy (€ 12.65).

[6] As the 2009 study by the BMFSFJ (p. 11) shows, a more differentiated picture also emerges for the sub-groups within sectors O and P. While in the subsections of sector O a high earnings gap is also associated with a high proportion of women, the situation in the sector P is reversed.

[7] The situation for 2010 and 2014 represents a change from 2007/08. According to the Quarterly Earnings Survey for the years 2007 and 2008, the gender pay gap was lower among part-timers than among full-timers in the private sector only, whereas in the public sector, the gaps were at about the same level at 7.2 % and 7.5 % (BMFSFJ 2009, p. 13).

Diagram 2:

Unadjusted Gender Pay Gap Among Full-Time and Part-Time Workers by Sector, 2010 and 2014 (in %)



Sources: Research Data Center of the Federal and State Statistical Offices (*FDZ der Statistischen Ämter des Bundes und der Länder*), Structure of Earnings survey (*Verdienststrukturerhebung*) 2014, own calculations.

The presumption expressed here and verified later by means of the decomposition analysis is that women with reduced working hours in the public sector are more frequently allocated to higher performance groups (*Leistungsgruppen*) than this is the case in the private sector. In addition, the wages of part-time workers in the private economy, more than in the public sector, are depressed by marginally employed workers; this is especially true for women. Also in full-time jobs, women earned 3.63 euros more per hour in the public sector compared to the private sector in 2014. By contrast, full-time wages of men in the public and in the private sector are more similar. In addition, men working in part-time jobs are being penalized (compared to male full-timers) more severely than women (compared to female full-timers) in terms of wages, not only in the private but also in public sector, which explains women's wage advantage in part-time jobs.

Table 4:

Average Hourly Wages by Sector, Gender and Work Volume, 2010 and 2014 (euros)

	Sector O Public Administration, Defence, and Compulsory Social Security		Sector P Education		Sectors O+P Public Sector		Private Economy	
	Full-time	Part-time	Full-time	Part-time	Full-time	Part-time	Full-time	Part-time
2010								
Men	17.87	15.02	22.10	13.61	18.81	13.95	17.81	10.02
Women	16.72	16.54	19.62	16.66	17.84	16.60	14.66	11.60
2014								
Men	19.85	14.21	24.48	15.67	20.89	15.15	19.42	11.05
Women	18.65	17.47	21.62	18.42	19.86	17.99	16.23	12.65

Sources: Research Data Center of the Federal and State Statistical Offices (*FDZ der Statistischen Ämter des Bundes und der Länder*), Structure of Earnings survey (*Verdienststrukturerhebung*) 2014, own calculations.

Different developments in sectors O and P between 2010 and 2014

In sector O, part-time work is dominated by women even more strongly than in sector P. In 2014, 9 (8) out of 10 part-time workers in sector O (P) were women. In the private economy, approximately three quarters of the part-time employed were women.

Among part-time workers, an interesting relationship between the gender pay gap and the female employment share emerges. While the earnings advantage of part-time employed women in sector O increased between 2010 and 2014, it has decreased somewhat in sector P. Simultaneously, the female employment share among part-timers increased in sector P and slightly declined in sector O (see **Table 5**). The intuition behind this pattern is as follows: The more women push into part-time jobs in the public sector (the more women leave these jobs), the more heterogeneous (the more homogeneous) is the pay distribution of women, which tends to increase (decrease) the pay gap relative to part-time employed men in these sectors.

Table 5:

Female Employment Shares by Sector, Full- vs. Part-Time Workers, 2010 and 2014 (in %)

	Sector O		Sector P		Sectors O+P		Private Economy	
	Public Administration, Defence, Compulsory Social Security		Education		Public Sector			
	Full-time	Part-time	Full-time	Part-time	Full-time	Part-time	Full-time	Part-time
2010	36.4	92.1	53.0	77.2	40.5	83.5	28.9	76.6
2014	39.8	90.5	53.1	80.2	44.0	84.6	28.9	75.8

Sources: Research Data Center of the Federal and State Statistical Offices (*FDZ der Statistischen Ämter des Bundes und der Länder*), Structure of Earnings survey *(Verdienststrukturerhebung)* 2014, own calculations.

3.1.3 Unadjusted Gender Pay Gap among Civil Servants vs. Employees

Among civil servants in the public sector, women earn more than men; among employees, the pay gap is in favour of men.

Among civil servants in the public sector, women are slightly less represented than are men (with a female share of 45.7 % in 2014), while among employees, they represent around two-thirds of the workforce (the proportion of women in 2014 was 68.0 %, see **Table 6**). Even in the private sector, where women generally represent a lower proportion of workers than in the public sector, women are relatively more likely to be employees than civil servants. As **Figure 3** shows, female civil servants achieved an earnings advantage of 2.0 % (3.2 %) relative to male civil servants in 2014 (2010). By contrast, among employees, men earned 4.4 % (4.9 %) more than women in 2014 (2010). In the private sector, the earnings ratio for both groups of workers is much less favorable for women than in the public sector. Specifically, earnings among female and male civil servants in the private sector in 2014 were virtually balanced.

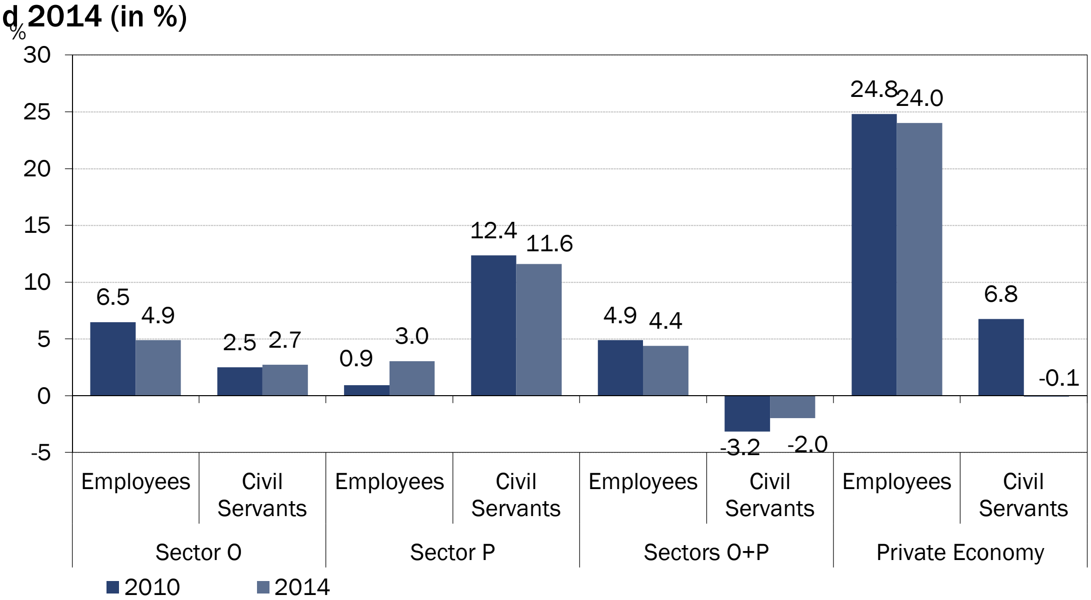
However, the number of civil servants in the private sector is extremely low (accounting for only 0.3 % of total private sector employment), implying that earnings parity in this group should not be overrated. Persons registered here are predominantly employed in the telecommunications, post, and research and development (R&D) sector. Among employees in the private sector, the gender pay gap was 24.0 % in 2014. A higher proportion of women among employees in the public (compared to the private) sector (see **Table 6**) is associated with a significantly lower gender pay gap in this group in the public (compared to the private) sector. The same applies to the group of civil servants. But public service law also plays a role. For example, the Equality Enforcement Act for the federal administration of 30.11.2001 stipulates that positions with supervising and management tasks must also be opened for part-time workers (§ 13 para. 1 DGleiG, see also Federal Ministry of the Interior (BMI) 2001, p. 15). However, structural weaknesses in public service law are repeatedly criticized on the grounds that they systematically discriminate against women, especially in personnel assessment procedures (Battis 2017, p. 30).[8]

Female civil servants in sector P are less likely to hold senior positions and earn about 12 % less than male civil servants.

In the internal differentiation of the public sector between sectors O and P, the high earnings advantage of male civil servants in sector P stands out, who earned 11.6 % more than female civil servants in this group in 2014 (see **Diagram 3**). In sector O, however, the respective wage gap was only 2.7 %. The high gap among civil servants in P is driven by the different representation of women and men in different performance groups. In detail, more than 60 % of men but less than 30 % of women are allocated to the highest performance group. In sector O and in the private economy, this difference is much less pronounced.

Diagram 3:

Unadjusted Gender Pay Gap among Civil Servants and Employees by Sector, 2010 and 2014 (in %)



Sources: Research Data Center of the Federal and State Statistical Offices (*FDZ der Statistischen Ämter des Bundes und der Länder*), Structure of Earnings survey (*Verdienststrukturerhebung*) 2014, own calculations.

8 Critics point out that characteristic and behavior-related criteria as e.g. carrying out a job on a part-time basis still predominates over task- and outcome-related criteria (Battis 2017).

Table 6:

Female employment shares by sector, civil servants vs. employees, 2010 und 2014 (in %)

	Sector O		Sector P		Sectors O+P		Private Economy	
	Public Administration, Defence, and Compulsory Social Security		Education		Public sector			
	Employees	Civil servants	Employees	Civil servants	Employees	Civil servants	Employees	Civil servants
2010	67.9	37.0	69.5	68.8	68.6	46.3	43.3	31.6
2014	65.7	37.9	70.8	60.4	68.0	45.7	43.9	33.7

Sources: Research Data Center of the Federal and State Statistical Offices (*FDZ der Statistischen Ämter des Bundes und der Länder*), Structure of Earnings survey *(Verdienststrukturerhebung*) 2014, own calculations.

3.1.4 Unadjusted Gender Pay Gap in East vs. West Germany

Wage differences are less pronounced in the public and in the private sector in eastern Germany than in western Germany.

As for the economy as a whole, for both the public and private sector, the pay gap between men and women in the eastern part of Germany is significantly lower than in the West (see Figure 4). For the West German public sector the earnings advantage of men was 6.6 % in 2014, while the wages of men and women in the East German public sector were virtually balanced (the pay gap was 0.1 %). In the West German private economy, the wage gap in favour of men in 2014 was 25.3 %, almost twice as high as in the East German private economy with 13.4 %. Within the two German regions wage differences in the public sector are much lower than in the private sector. In the East German public sector, women even registered an earnings lead in 2010, which, however, turned into a slight wage disadvantage by 2014. In the East German private economy, by contrast, the women's wage disadvantage that had already existed in 2010 actually increased even further by 2014. One reason for this may have been the stronger wage growth in male-dominated sectors during this period[9], while the western adjustment of earnings in the East German public sector, which particularly benefited East German women, had already taken place in an earlier period.

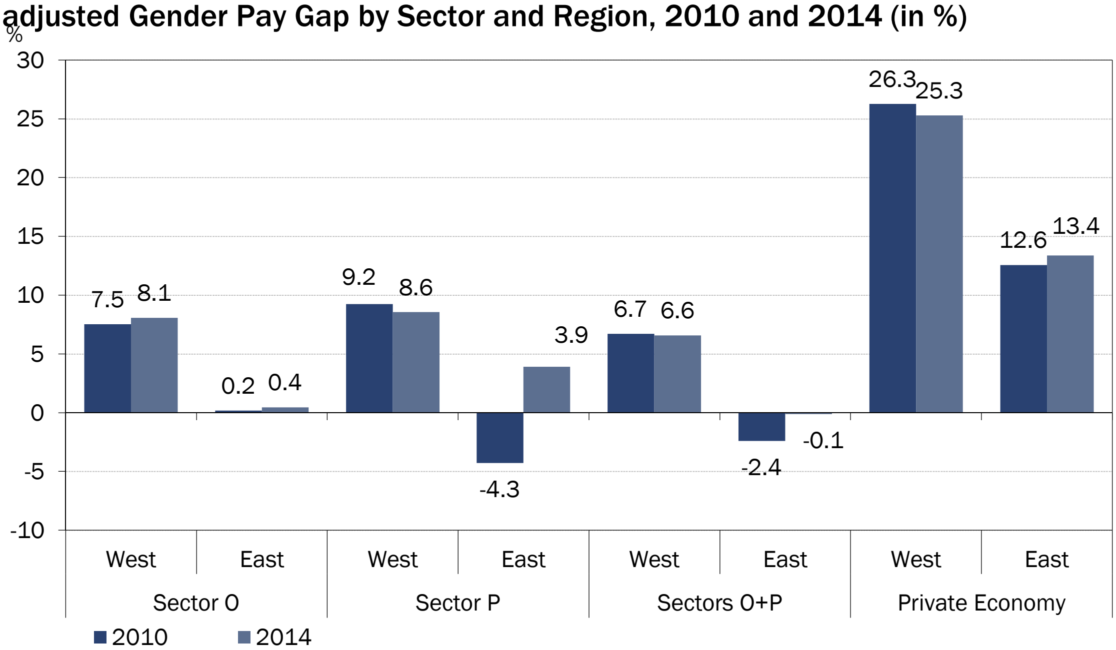
The east-west pattern in the gender pay gap, as found in this study, is not only similar, but also the values are almost identical to those identified for Q4 of 2008 based on the Quarterly Earnings Survey (BMFSFJ 2009, p. 14). The wage gap in the East German private sector at that time was 13 %, while there was no significant gender-specific wage gap for the East German public sector. In West Germany, the gap in the public sector was around 8 % and approximately 23 % in the private economy.[10]

---

[9] The wages of workers in the manufacturing sector in eastern Germany increased by 11.8 % in the period 2009-2013, but only by 6.7 % in the health and social care sector (Federal Statistical Office 2015).

[10] Compared to the gender pay gap calculated by the Federal Statistical Office for the overall economy (without sector O), which for 2010 were at 22 % (total Germany), 24 % (West) and 7 % (East Germany) and for 2014 at 22 % (total), 23 % (West) and 9 % (East; Federal Statistical Office 2018), the values for the private sector are with 25-26 % (West) and around 13 % (East) significantly higher in both years. Again, this is due to the fact that sector P is included in the aggregate economy, but not in the private sector aggregate.

Unadjusted Gender Pay Gap by Sector and Region, 2010 and 2014 (in %)



Sources: Research Data Center of the Federal and State Statistical Offices (*FDZ der Statistischen Ämter des Bundes und der Länder*), Structure of Earnings survey (*Verdienststrukturerhebung*) 2014, own calculations.

In East Germany, men and women receive approximately equal wages in sector O, while in sector P, the wage advantage of women in 2010 turned into one in favour of men in 2014.

The internal differentiation of the public sector confirms the pattern of higher wage gaps in western compared to eastern Germany for both sectors O and P. The pattern of the higher gender pay gap in sector P (compared to sector O) is evident for 2014 for both German regions. In 2010, however, East German women in sector P still had a wage advantage over East German men; this had turned into a wage disadvantage by 2014. The above stated slight deterioration in the wage situation of East German women compared to East German men in the public sector overall between 2010 and 2014 was therefore driven by sector P's development.

The relatively favorable earnings position of women in the East German public sector (in comparison to men), combined with a comparatively high employment rate of East German women in the public sector, contributes to the significantly lower East German gender pay gap compared to the West German value.

The big difference in average wages between the public and the private sector in East Germany is striking. While the average wage of men (women) in the East in the private economy was about 30 % (39 %) below the wage in the public sector, the difference in the West was only 7 % (23 %; see **Table 7**). The above-mentioned west-east adjustment of earnings in the public sector implied that women in the East German public sector earned more on average in both years 2010 and 2014 than women in the West German public sector, whereby the within-female pay differential has even slightly increased until 2014.

Table 7:

Average hourly wages by sector, gender and region, 2010 und 2014 (euros)

	Sector O		Sector P		Sectors O+P		Private Economy	
	Public Administration, Defence, and Compulsory Social Security		Education		Public Sector			
	West	East	West	East	West	East	West	East
2010								
Men	17.91	16.80	19.51	17.55	18.38	17.00	17.37	12.06
Women	16.61	16.78	17.79	18.32	17.19	17.41	13.36	10.64
2014								
Men	19.51	18.67	21.41	20.93	20.08	19.21	18.74	13.43
Women	18.00	18.58	19.65	20.13	18.80	19.24	14.56	11.75

Sources: Research Data Center of the Federal and State Statistical Offices (*FDZ der Statistischen Ämter des Bundes und der Länder*), Structure of Earnings survey *(Verdienststrukturerhebung)* 2014, own calculations.

Men earned slightly lower average wages in the East German public sector in 2014 than in the West German public sector, but male wages in the East German public sector also heavily caught up between 2010 and 2014. In combination with the fact that the proportion of women employed in the public sector in East Germany is significantly higher than in West Germany (see **Table 8**), another important reason for the relatively lower East German gender pay gap in comparison to the West German one becomes evident: the first East German specificity - a much more favourable earning position of women compared to men in the public sector relative to the private economy - is given particular weight by the second East German specific feature - the far higher share of female workers in the public sector in total employment.

Table 8:

Employment distribution of men and women across sectors, by region, 2010 and 2014 (in %)

	2010		2014	
	West	East	West	East
Men				
Sector O	7.5	9.8	7.5	9.6
Sector P	3.6	3.5	3.9	3.3
Sectors O+P	11.1	13.3	11.4	13.0
Private Economy	88.9	86.7	88.6	87.1
Women				
Sector O	10.7	12.9	10.2	12.8
Sector P	9.3	9.9	9.1	9.6
Sectors O+P	20.0	22.9	19.3	22.4
Private Economy	80.0	77.1	80.7	77.6

Sources: Research Data Center of the Federal and State Statistical Offices (*FDZ der Statistischen Ämter des Bundes und der Länder*), Structure of Earnings survey *(Verdienststrukturerhebung)* 2014, own calculations.

Behind the east-west differences in the unadjusted gender pay gaps lays a different employment behavior of women in East and West Germany. However, which factors exactly explain the regional differences can only be seen in the decomposition analyses (see Section 3.2 below); this applies at least to the variables observable in this data. As is known from other studies, gender differences in actual employment experience play a significant role (see, for example, Boll/Leppin 2015 based on the Socio-Economic Panel), which, however, cannot be observed in the Structure of Earnings Survey. After a family break, East German women on average return to work earlier than West German women (Drahs et al., 2015). While West German women tend to move significantly more frequently into atypical employment (mostly into part-time employment) if they have children - regardless of whether they are single parents or live together with a partner – for East German women such family-oriented employment behavior is only occasionally witnessed for transitions from non-employment (RWI 2016, p. 60ff).

Table 9:

Female employment shares, by sector and region, 2010 und 2014 (in %)

	Sector O		Sector P		Sectors O+P		Private Economy	
	Public Administration, Defence, and Compulsory Social Security		Education		Public Sector			
	West	East	West	East	West	East	West	East
2010	54.4	55.0	68.8	72.5	60.3	61.4	42.9	45.2
2014	53.5	55.2	66.6	72.8	59.0	61.6	43.6	45.3

Sources: Research Data Center of the Federal and State Statistical Offices (*FDZ der Statistischen Ämter des Bundes und der Länder*), Structure of Earnings survey *(Verdienststrukturerhebung*) 2014, own calculations.

The female employment shares are quite similar in eastern and western Germany, both in the public and in the private sector (see **Table 9**). Only in Sector P the proportion of women in East Germany is slightly higher. Gender differences with respect to employment shares can thus by no means explicate the observed East-West differences in gendered pay.

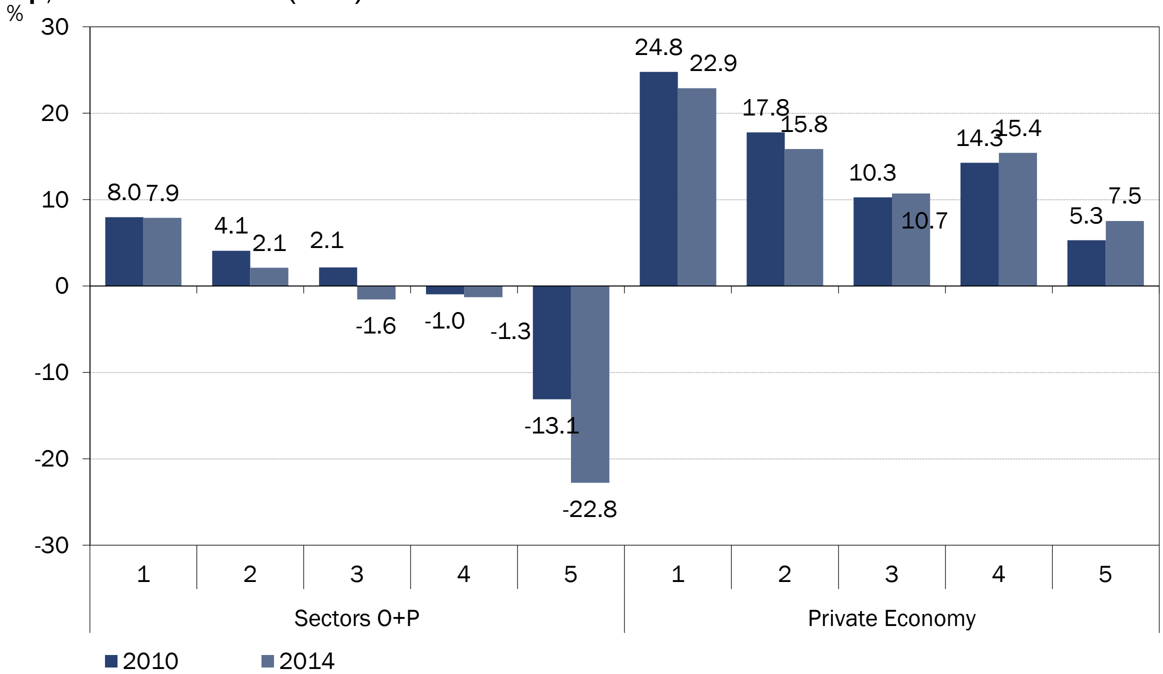
3.1.5 Unadjusted Gender Pay Gap by Performance Groups

Managerial positions in the public and in the private sector are dominated by men and exhibit pay gaps in favour of men.

When we divide workers into different performance groups that reflect the level of requirements or task of the respective activity, some interesting interrelations become apparent. In high performance groups, that is for workers in managerial or senior positions, men earn higher wages than women both in the the public and in the private sector (see **Diagram 5a**). This also applies to the individual sectors O and P (see **Diagram 5b**), although less pronounced in sector P than in sector O.

Diagram 5a:

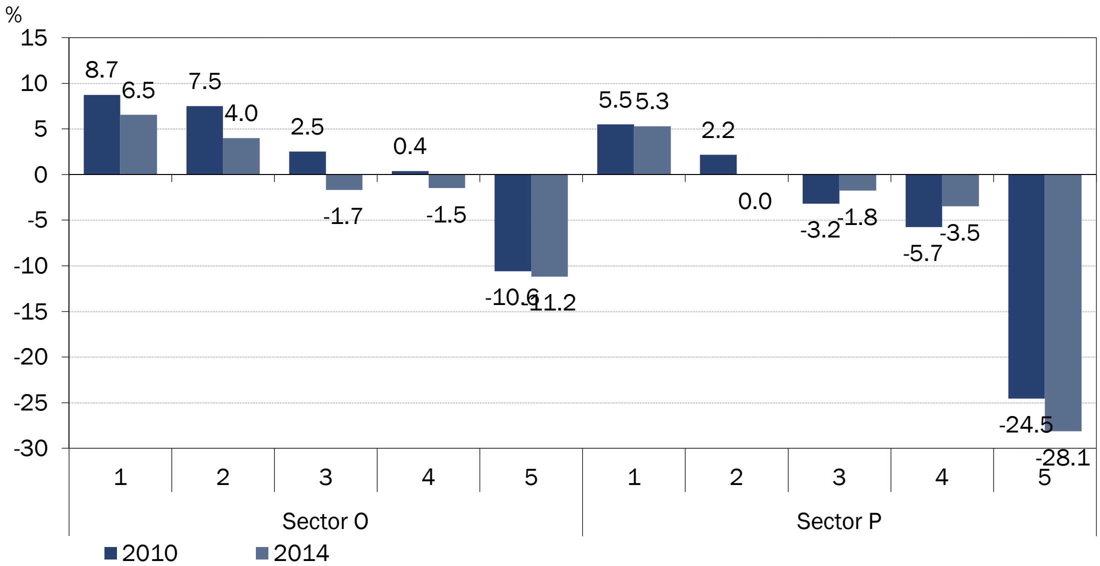
Unadjusted Gender Pay Gap in the Public Sector and the Private Economy by Performance Group, 2010 and 2014 (in %)



1=Workers in Mangerial Positions, 2=Workers in Senior Positions, 3=Skilled Workers, 4=Semi-Skilled Workers, 5=Unskilled Workers.
Sources: Research Data Center of the Federal and State Statistical Offices (*FDZ der Statistischen Ämter des Bundes und der Länder*), Structure of Earnings survey (*Verdienststrukturerhebung*) 2014, own calculations.

Diagram 5b:

Unadjusted Gender Pay Gap in Sectors O and P by Performance Group, 2010 and 2014 (in %)



1=Workers in Mangerial Positions, 2=Workers in Senior Positions, 3=Skilled Workers, 4=Semi-Skilled Workers, 5=Unskilled Workers.
Sources: Research Data Center of the Federal and State Statistical Offices (*FDZ der Statistischen Ämter des Bundes und der Länder*), Structure of Earnings survey (*Verdienststrukturerhebung*) 2014, own calculations.

Managerial positions are clearly male domains in 2014, especially in sector O and in the private economy, which exhibit female shares of around 32 % (Sector O) and around 26 % (private economy) (see **Table 10**). In sector P, on the other hand, managerial positions are roughly equally divided between men and women. The proportion of women here was 50 % in 2014. Wherever women are proportionately equally represented, the wage structure is also more balanced. It should be noted (as noted above) that the proportion of women in this sector is in total more than two-thirds.

Table 10:

Female employment shares by sector and performance group, 2010 und 2014 (in %)

			2010	2014
Sector O	Public Administration, Defence, and Compulsory Social Security	Managerial positions	30.8	31.8
		Senior positions	57.0	51.0
		Skilled workers	58.4	62.1
		Semi-skilled workers	34.1	32.0
		Unskilled workers	63.0	85.3
Sector P	Education	Managerial positions	49.9	49.6
		Senior positions	77.4	75.6
		Skilled workers	85.2	86.4
		Semi-skilled workers	76.0	78.9
		Unskilled workers	74.6	77.5
Sectors O+P	Public Sector	Managerial positions	43.4	44.1
		Senior positions	65.2	57.9
		Skilled workers	64.4	69.3
		Semi-skilled workers	44.8	46.8
		Unskilled workers	69.2	79.8
Private Economy		Managerial positions	23.5	25.8
		Senior positions	35.8	35.1
		Skilled workers	43.5	44.5
		Semi-skilled workers	41.2	44.0
		Unskilled workers	53.7	54.4

Sources: Research Data Center of the Federal and State Statistical Offices (*FDZ der Statistischen Ämter des Bundes und der Länder*), Structure of Earnings survey *(Verdienststrukturerhebung*) 2014, own calculations.

Lower performance groups are characterized by a higher proportion of women as well as by lower earnings disadvantages or even slight earnings advantages of women.

In lower performance groups, the gender pay gap is smaller than in higher ones, or rather turns even into a high wage advantage for women in the public sector, especially for unskilled workers. This applies not only to the public sector as a whole, but also seperately to the sectors O and P. In sector P, however, the turnaround in favour of women already starts in a higher performance groups. In the context of the higher representation of women in all performance groups, with the exception of the lowest, in sector P compared to sector O, it can be observed for the public sector that a higher representation of women in the performance groups is associated with lower wage disadvantages of women; the only exception is the lowest earnings group. In the private economy, the wage advantage of men over women can be observed for all performance groups and moreover, its magnitude is higher in all groups than in the respective public sector groups. Thus, as a common pattern that can be observed for the private and the public sector, men's relative wage advantage over women is much greater in higher than in lower earnings groups.

Compared to the private economy, the share of women in unskilled worker-positions in the public sector (among them cleaning staff in particular) is significantly higher, and between 2010 and 2014 it has risen by around ten percentage points. Between 2010 and 2014, the wage structure, apart from the lower performance groups, developed more favourably for women in the private economy. However, the large change in the gap and in the proportion of women in unskilled worker-positions should not be over-interpreted due to the small number of cases.

3.2 Decomposition of the Gender Pay Gap: Explained vs. Unexplained Part

The microdata used in this study to calculate the unadjusted gender pay gap also allows for the pay gap to be decomposed into an explained and an unexplained part (see Section 2.2 . It can thus be analyzed which part of the pay gap can be explained with different characteristics between men and women and which part of the gap remains even if women and men with similar characteristics are compared. As formerly mentioned, the so-called 'unexplained part' (also called the 'adjusted pay gap') is not completely unexplained, but contains quantifiable evaluation effects. However, the usual terminology 'explained / unexplained' is retained for this section. Also, the disaggregation of the gender pay gap in this study is confined to the explained part (see below, section 3.3). In the following, we limit ourselves to the year 2014 except for total employment for which both years 2010 and 2014 will be presented.

3.2.1 Explained and Unexplained Part of the Gender Pay Gap in Total Employment

The gender pay gap is dominated by the explained part.

In line with other studies on the basis of the Structure of Earnings Survey for Germany (Federal Statistical Office 2010, Boll et al. 2016), the present study shows that the explained part of the wage gap generally far exceeds the unexplained part (see **Diagrams 6 and 7**). The only exception is sector O for the year 2010. The individual characteristics of the explained part are examined in detail in chapter 3.3. The exact ratio between the explained and explained part varies somewhat between sectors and years. Noticeable are the findings for sector O. After the explained part accounted for only 40 % of the total gap in 2010, in 2014 it matched the share in the other sectors. Between 2010 and 2014, the explained gap was widening in both the public and the private sector, while the unexplained gap decreased.[11]

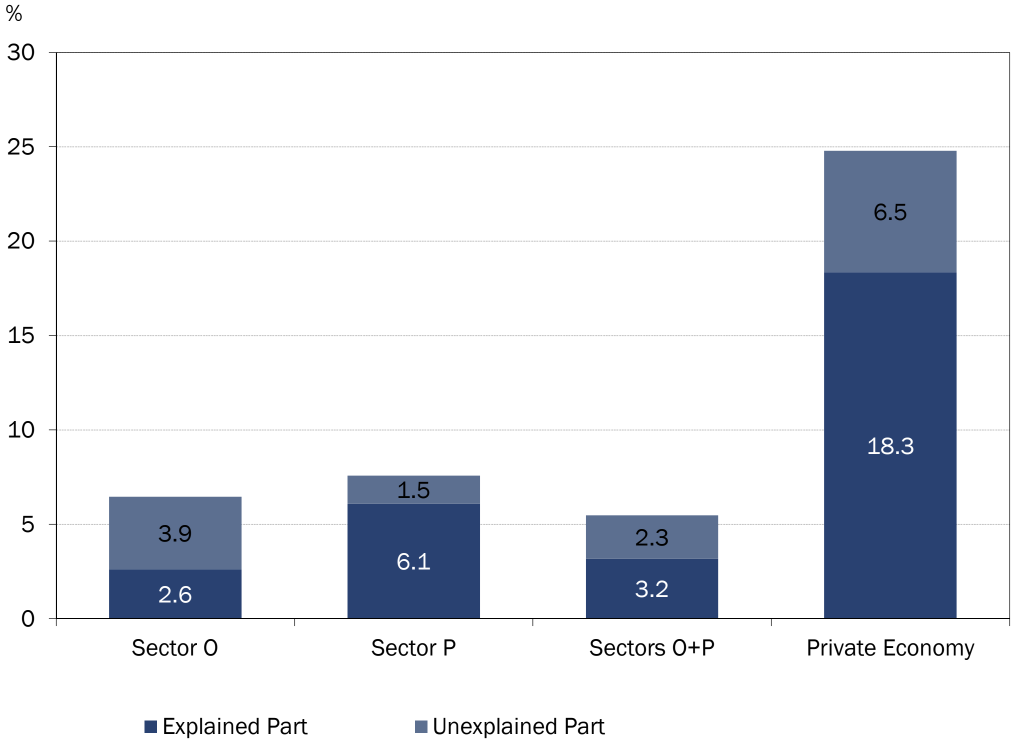
The higher weighting of the explained part of the gap in the overall gap is also noticeable for 2014. As shown above, the pay gap in sector P is higher overall, although it is lower in single performance groups (see Diagram 5b).

[11] In this context, discrepancies in the data set may not be excluded. These were confirmed by the Hessian State Statistical Office (Hessisches Statistisches Landesamt), which is responsible for Structure of Earnings Survey, but could not be finally clarified up to the publication of our study.

Although the sexes in sector P were more evenly represented in higher performance groups than in sector O, the proportion of men in sector P is much higher in managerial positions than among women in this sector (see **Table 9**). A good part of the pay gap in Sector P is therefore already explained by the different sorting of the sexes into the performance groups.

Diagram 6:

Explained and Unexplained Part of the Gender Pay Gap in Total Employment by Sectors, 2010 (in %)



Sources: Research Data Center of the Federal and State Statistical Offices (*FDZ der Statistischen Ämter des Bundes und der Länder*), Structure of Earnings survey *(Verdienststrukturerhebung)* 2014, own calculations.

Table 11:

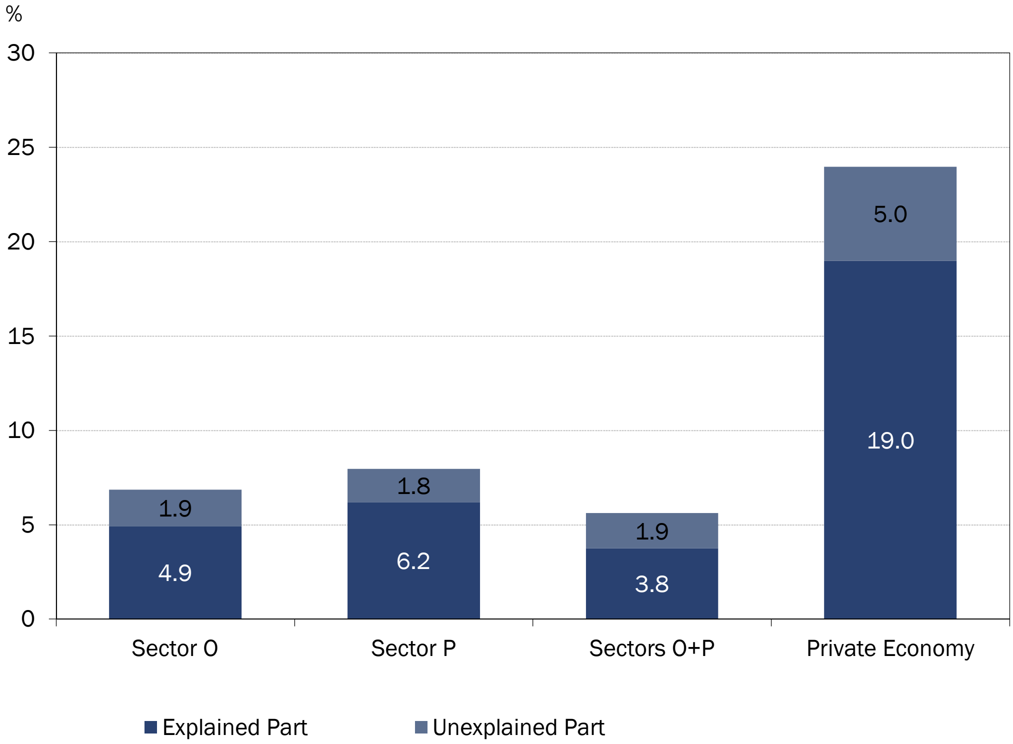
Workers' Performance Group Distribution, by Gender and Sector (Without the Marginally Employed), 2014 (in %)

	Sector O		Sector P		Sectors O+P		Private Econmy	
	Public Administration, Defence, and Compulsory Social Security		Education		Public Sector			
	Men	Women	Men	Women	Men	Women	Men	Women
Workers in Managerial Positions	15.6	6.4	60.9	26.9	29.2	15.8	11.1	5.4
Workers in Senior Positions	43.0	39.6	19.3	26.9	35.9	33.8	21.2	16.0
Skilled Workers	32.9	47.5	11.7	33.2	26.5	41.0	48.1	53.9
Semi-Skilled Workers	7.9	3.3	2.6	4.4	6.3	3.8	14.1	15.5
Unskilled Workers	0.6	3.3	5.5	8.5	2.1	5.7	5.5	9.2

Sources: Research Data Center of the Federal and State Statistical Offices (*FDZ der Statistischen Ämter des Bundes und der Länder*), Structure of Earnings survey (*Verdienststrukturerhebung*) 2014, own calculations.

Diagram 7:

Explained and Unexplained Part of the Gender Pay Gap in Total Employment, 2014 (in %)



Sources: Research Data Center of the Federal and State Statistical Offices (*FDZ der Statistischen Ämter des Bundes und der Länder*), Structure of Earnings survey *(Verdienststrukturerhebung*) 2014, own calculations.

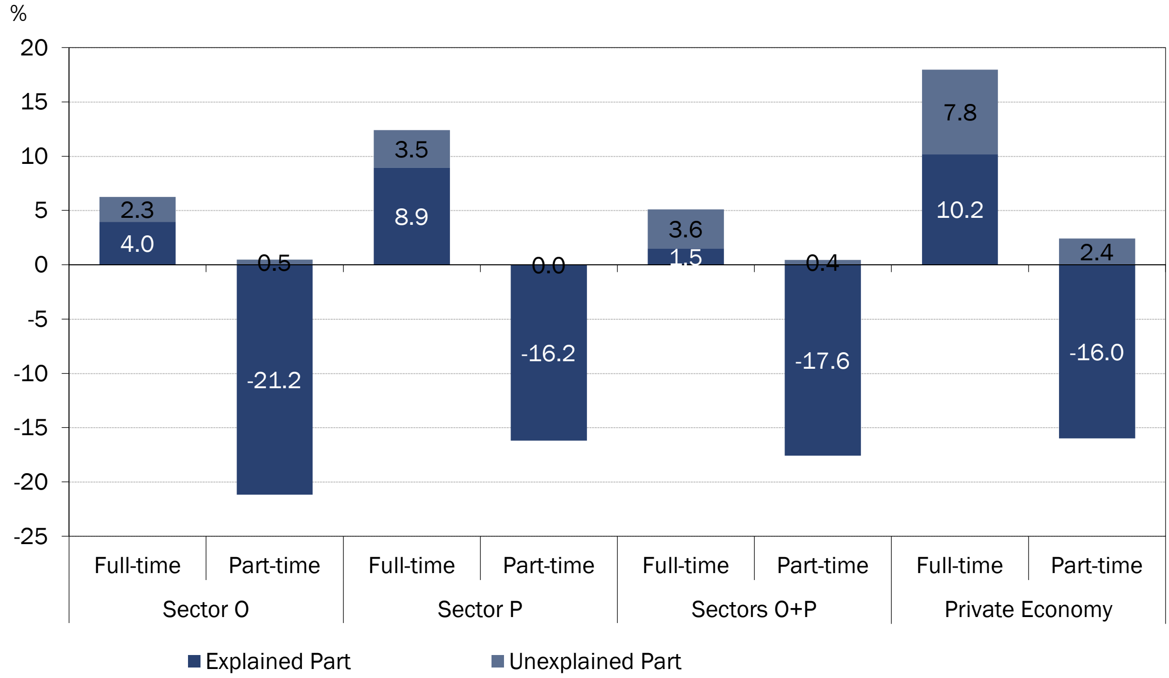
3.2.2 Explained and Unexplained Part of the Gender Pay Gap Among Full- vs. Part-Time Workers

The wage advantage of women over men among the part-time employed results from the relatively high frequency of marginal employment, temporary employment and the relatively short firm tenure among men compared to women.

The wage advantage of women among part-time workers in sectors O and P can almost entirely be explained by their comparatively advantageous characteristics (see **Figure 8**). The unexplained part of the gender pay gap referring to part-time workers also plays a subordinate role in the private economy. Part-time employed men are a special group whose wage-related characteristics in the public sector are similar to those in the private economy. Part-time employed men in the public sector are with a portion of approximately 40 % far more frequently marginally employed than women in this group (10 %). In addition, 70 % of men⸗s employment contracts in this group are temporary; among women, this is only the case for around 22 %. Another main driver for the advantage of women is their much higher firm tenure of around 23 years compared to only 12 years for men. Of the above stated characteristics, in sector O, the proportion of marginally employed among men stands out. In sector P, in addition to the above factors, the fewer years of potential work experience (men: 11 years, women: 23 years) are also significant. In the private economy, similar relationships apply as in the public sector, with more than one in two men being marginally employed.

Diagram 8:

Explained and Unexplained Part of the Gender Pay Gap among Full-time- and Part-Time Workers, by Sectors, 2014 (in %)



Sources: Research Data Center of the Federal and State Statistical Offices (*FDZ der Statistischen Ämter des Bundes und der Länder*), Structure of Earnings survey (*Verdienststrukturerhebung*) 2014, own calculations.

The inclusion of marginal employment is thus probably a main reason why we find a wage advantage for women in part-time employment in all sectors considered. The Federal Statistical Office, which determines a pay gap of 4 % in favour of men among part-time workers in the overall economy in 2013, had excluded marginal workers from the underlying sample (Federal Statistical Office 2014).

The explained part of the gender pay gap among full-time workers is driven by the performance group.

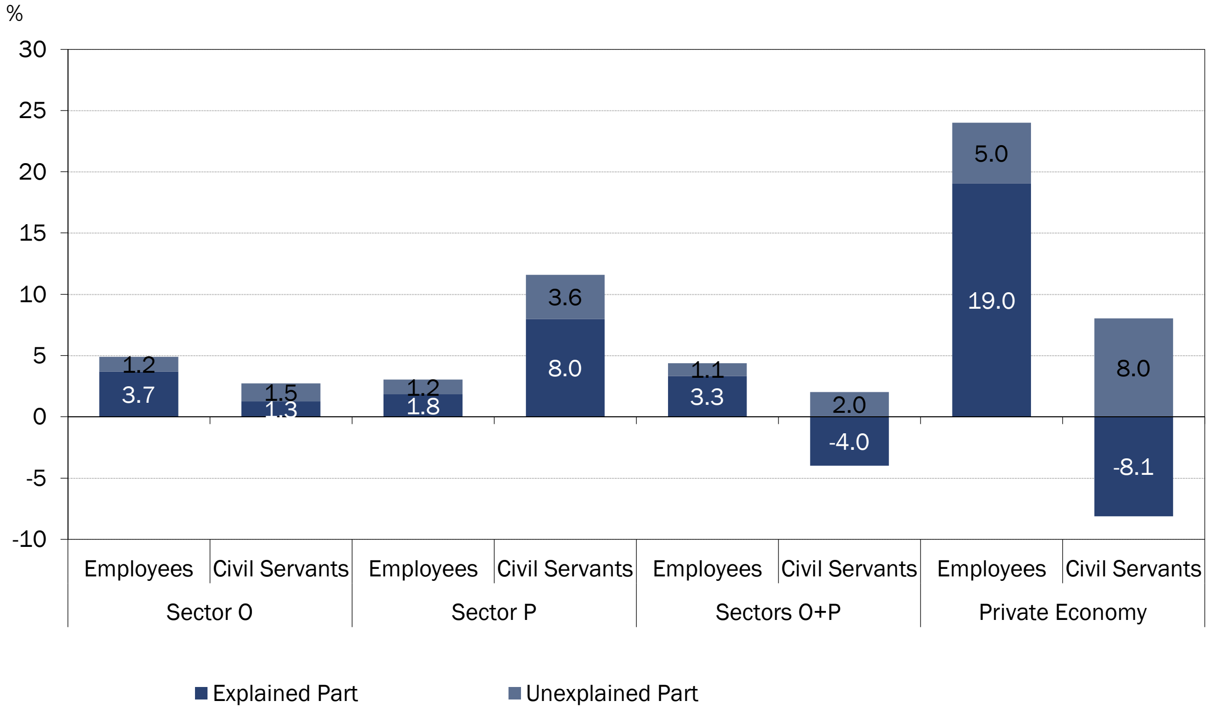
Among full-time workers, the picture is somewhat more differentiated between the sectors. The explained part takes on a less important role. In the private economy, it accounts for just over half. In the entire public sector, the unexplained gap even dominates. The explained gap is determined by the performance group. Men work more often in managerial positions than women. In the private economy and in sector O, the proportion of men (11 % and 15 % respectively) lies just above that of women (around 7 %). The difference between men and women in sector P is much more serious in this respect. While nearly two-thirds of full-time employed men are assigned to the top performance group, the respective share of full-time women is only one-third.

3.2.3 Explained and Unexplained Part of the Gender Pay Gap Among Civil Servants vs. Employees

The structure of characteristics among civil servants in the overall public sector and in the private economy work in favour of women, while for employees the opposite is the case (see **Figure 9**).

Diagram 9:

Explained and Unexplained Part of the Gender Pay Gap among Civil Servants vs. Employees, by Sector, 2014 (in %)



Sources: Research Data Center of the Federal and State Statistical Offices (*FDZ der Statistischen Ämter des Bundes und der Länder*), Structure of Earnings survey (*Verdienststrukturerhebung*) 2014, own calculations.

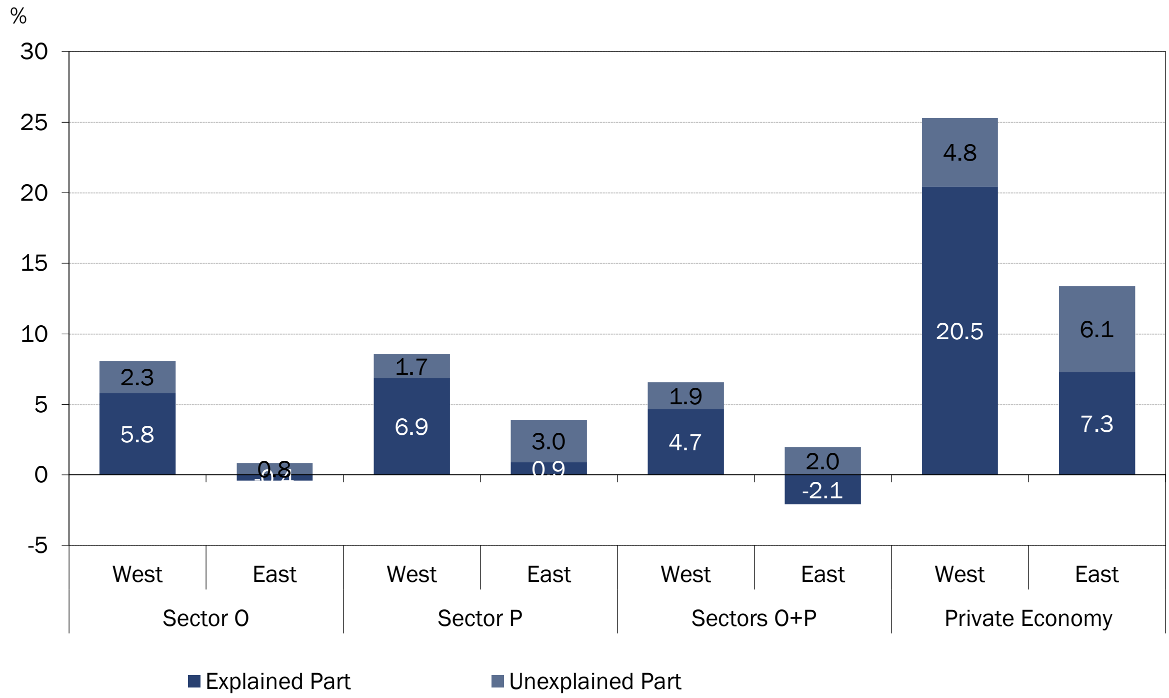
Looking at the public sector as a whole, the highest educational level attained is an important factor for the different directions of the explained gap. Among employees, the average educational attainment of men is higher than that of women. Around one third of men have a medium level of education and around half achieved a high level. For women it is the other way around. Among civil servants, however, about two-thirds of men have a high level of education; among women it is 8 out of 10. The remaining female civil servants almost exclusively exhibit a medium level of education, while among male civil servants in addition to the approximately 27 % with a medium education, 5 % with a low level of education are also represented.

Divided into sectors O and P, the uneven distribution across the performance groups within men and within women (especially in sector P, see Table 9 above) is the reason for the positive explained gap. The distinction within the private economy is not discussed in detail because of the small number of civil servants in this sector.

3.2.4 Explained and Unexplained Part of the Gender Pay Gap in East vs. West Germany

In the East-West comparison within sectors, the unexplained part of the gender pay gap is roughly the same; as a result, East-West wage gap differences are mainly due to different characteristics among men and women (see **Diagram 10**).

Diagram 10:
Explained and Unexplained Gender Pay Gap by Sector and Region, 2014 (in %)



Sources: Research Data Center of the Federal and State Statistical Offices (*FDZ der Statistischen Ämter des Bundes und der Länder*), Structure of Earnings survey (*Verdienststrukturerhebung*) 2014, own calculations.

In East Germany, the gender wage gap can be explained to a lesser extent by different characteristics of men and women than in West Germany.

In eastern Germany, the explained gap is clearly below the respective value for West Germany in both sectors. One reason for this lies in the less pronounced difference in men's and women's shares of high performance groups in the East compared to the West.

Secondly, while in the West the proportion of marginally employed women and men is roughly the same, in the East the share of women is below the one of men, which reduces the gender pay gap. Thirdly, women in the East possess, on average, more years of potential work experience and a higher firm tenure than East German men. These relationships with regard to the performance groups, experience and seniority also apply to the private sector. In addition, economic sector and occupational affiliation provide a smaller contribution to the gender pay gap in east than in West Germany.

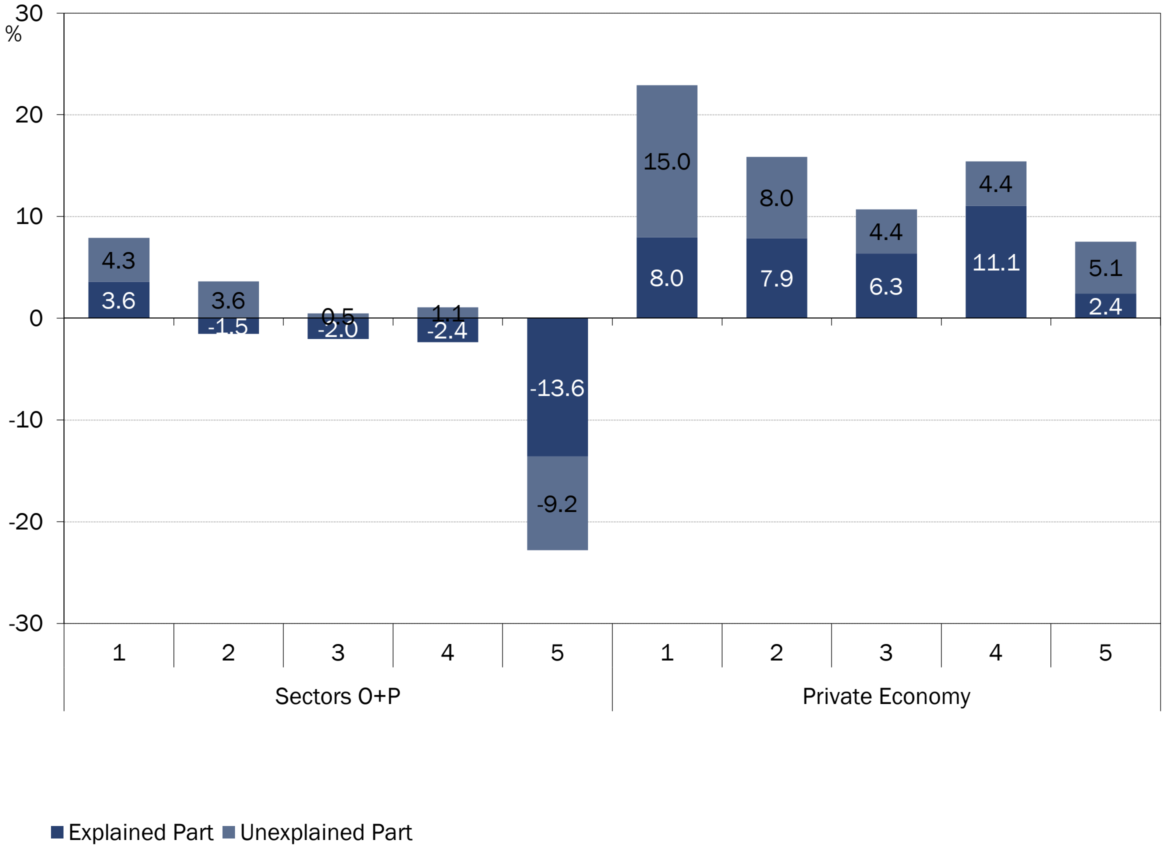
3.2.5 Explained and Unexplained Part of the Gender Pay Gap by Performance Group

Except for workers in managerial positions, the explained part operates in the public sector in favour of women, thereby decreasing the gender pay gap. In the private sector however, the explained part increases the gender pay gap in all performance groups.

The gap decomposition that is differentiated by performance group is presented only for the public sector as a whole, because of small observation numbers particularly among unskilled workers (see **Diagram 11**).

Diagram 11:

Explained and Unexplained Part of the Gender Pay Gap by Sector and Performance Group, 2014 (in %)



1=Workers in Mangerial Positions, 2=Workers in Senior Positions, 3=Skilled Workers, 4=Semi-Skilled Workers, 5=Unskilled Workers.
Sources: Research Data Center of the Federal and State Statistical Offices (*FDZ der Statistischen Ämter des Bundes und der Länder*), Structure of Earnings survey (*Verdienststrukturerhebung*) 2014, own calculations.

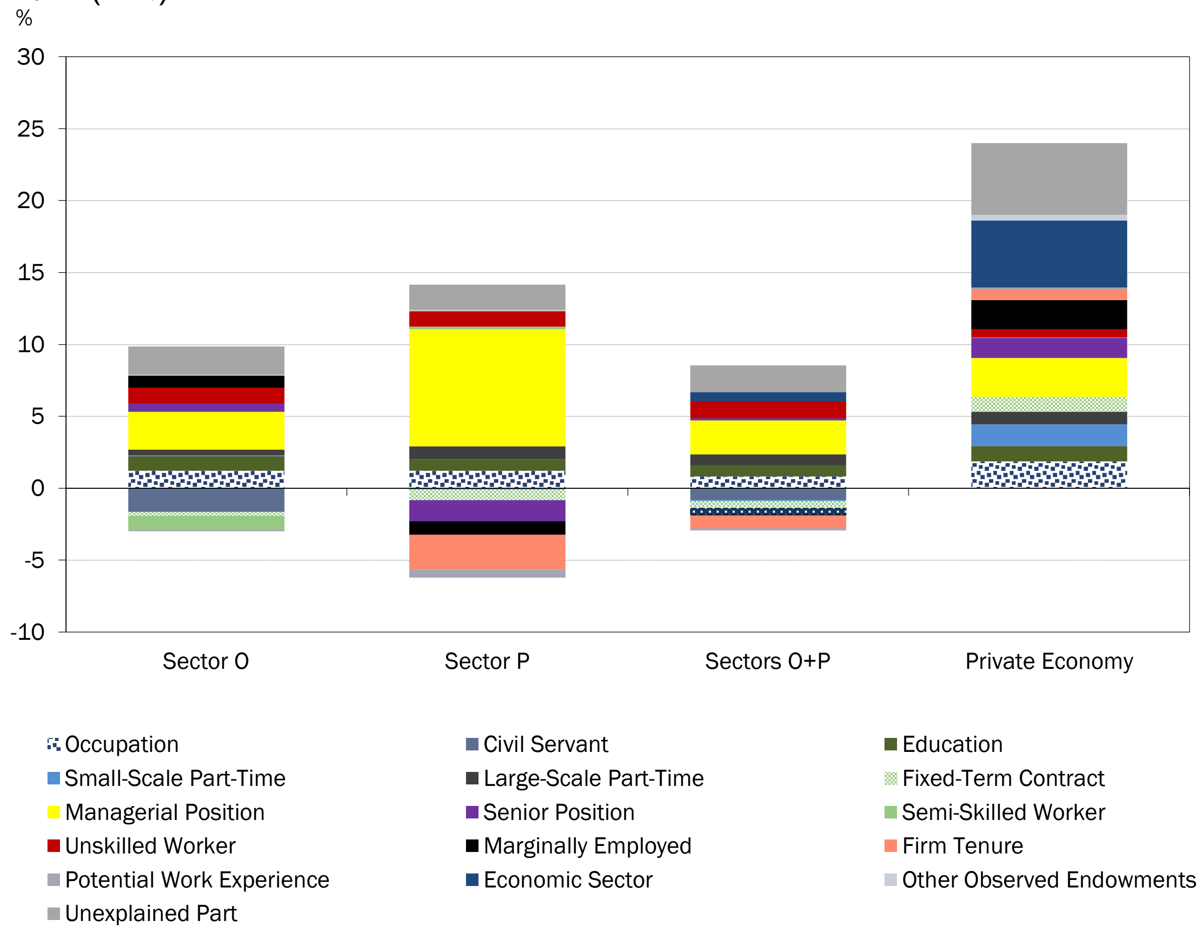
In the public sector, the explained part of the pay gap, apart from workers in managerial positions, operates in favour of women. In the first four performance groups, no single feature stands out, confirming previous findings for other sub-samples, namely that the performance group explains a large part of the gender pay gap (especially in sector P). The group of unskilled male workers overlaps to a large extent with the group of part-time employed male workers. Against this background, it is not surprising that similar aspects, such as the relatively high proportion of fixed-term employment contracts, relatively few years of working experience and firm tenure among men (compared to women) explain women's wage advantage. In the private economy, both the explained and the unexplained gap contribute to the gender pay gap in all performance groups. In accordance with the public sector, women's endowments are most advantageous to men's in the group of unskilled workers. As a single feature that determines the explained gap in favour of men, only the economic sector (and not for managerial workers) stands in the foreground in the private economy.

3.3 Single Components of the Explained Part of the Gender Pay Gap

As indicated earlier, certain features have a significant influence on the gender pay gap, while others hardly contribute. For 2014, **Diagram 12** shows the detailed breakdown of the explained part for total employment by sector. It turns out that men's relatively advantageous distribution of performance groups and educational levels as well as their lower part-time employment rate explain men's wage advantage. In the private economy, male workers also benefit from their employment in wage-attractive sectors.[12]

Diagram 12:

Decomposition of the Unadjusted Gender Pay Gap in Total Employment, by Sector, 2014 (in %)



Sources: Research Data Center of the Federal and State Statistical Offices (*FDZ der Statistischen Ämter des Bundes und der Länder*), Structure of Earnings survey (*Verdienststrukturerhebung*) 2014, own calculations.

[12] The detailed decomposition results by sector are shown in **Tables A1-A4** in the Appendix. The underlying separate wage estimates for men and women as well as the detailed descriptive statistics are available from the authors on request.

In all sectors (and especially in sector P), the characteristic of managerial workers stands out. Women are much less likely to be in the top performance group than men. In sector O (P), male employment accounted for 16 % (61 %) of the top performance groups, compared to 6 % (27 %) among women, in the private economy it is 11 % for men and only 5 % among women (see Table 9). Likewise, men's lower part-time rate (e.g., in the public sector: men: 14 %, women: 51 %; in the private economy: men: 14 %, women: 55 %) drives the gender pay gap. In this respect, there are hardly any differences across the sectors.

The educational level is also higher among men in the public sector and private economy than among women. Among males in sector O (P), more than half (around 80 %) had a high level of education in 2014, whereas in the private economy, the medium level of education dominated among men with two-thirds. In both divisions of the public sector, the proportion of lowly educated male workers was less than 10 %. In the private economy, the industry affiliation also accounts for a high proportion of the gender pay gap. Men are much more frequently employed in the wage-attractive manufacturing sector, whereas women tend to work in the Health Care and Social Services sector.

For a better overview, the features 'payment of supplements', 'federal state' and 'public sector influence' are summarized in a residual category ('other observed endowments'). Supplements are negligible in terms of their contribution to the wage gap. They are included in the model only for comparability with the specification of the Federal Statistical Office in the publication on the gender pay gap in 2006 (Federal Statistical Office 2010). Similarly, the public sector influence is irrelevant and of minor importance to the private economy's pay gap. Also the separate contribution of the individual federal states is insignificant against all other factors. This shows that the regional affiliation is linked to other observed characteristics, such that as soon as these characteristics are controlled for in the model, no independent effect remains for the federal state.

4 Summary

The Gender Pay Gap is being investigated in numerous studies. The Federal Statistical Office (2018) also considers the public sector separately, but without analyzing the individual causes of the differences in earnings. Other more detailed studies (e.g., BMFSFJ 2009) calculate the unadjusted pay gap for different subgroups in the public sector, e.g. for civil servants vs. employees. However, on the one hand, these calculations are based on outdated data from the years 2007 and 2008, and on the other hand, the used aggregate data does not allow for a decomposition of the pay gap into its main contributing factors. Consequently, inferences about the importance of single endowments of genders or the role of the adjusted gap comparing men and women with similar observable characteristics cannot be drawn based on this data.

For this reason, the present study examines not only the unadjusted gender pay gap of the public sector (that is, economic sectors O (Public Administration, Defence, and compulsory Social Security) and P (Education)) compared to the private economy (that is, all sectors except O and P), but also differentiates according to different sub-samples, decomposes the gap into an explained and an unexplained part and quantifies the individual components underlying the explained part. Both the methodology of the Oaxaca-Blinder decomposition and the list of explanatory variables used are mostly in accordance with the approach of the Federal Statistical Office (2010). The analyses are based on worker- and firm-related microdata of the 2010 and 2014 Structure of Earnings Survey, such that the gender pay gap's development over time can also be considered.

Despite a similar approach, the results of this study are only conditionally comparable to previous studies. The study by the BMFSFJ (2009) is based on aggregated data of the Statistics of the Public Service Personnel and the Quarterly Earnings Survey and on the other hand excludes marginally employed workers. In contrast to the present study, the Federal Statistical Office (2010) also includes workers in partial retirement, apprentices and trainees.

Results

The unadjusted gender pay gap in the public sector stood at 5.6 % in 2014 and was virtually unchanged compared to 2010. The gap in the private economy remained about four times as high. There is no clear relationship between the gender pay gap and the female employment share in the individual sectors.

In part-time jobs, women, like in the private economy, earn more than men in public sector; this is likely to be mainly due to the marginally employed workers included in this study (see below). In full-time jobs, the opposite is true, with men earning more than women. The gender pay gap in public sector is much more pronounced in part-time jobs than in full-time jobs. Different developments in sectors O and P between 2010 and 2014 can be observed. While the wage advantage of women in part-time employment in sector O has increased further between 2010 and 2014, it has decreased somewhat in sector P. Among civil servants, women in public sector earn more than men, and among employees, the wage gap is in favour of men. In contrast to the public sector as a whole, female civil servants in sector P earn about 12 % less than men. The main reason is that they are rarely represented in managerial positions. Wage differences are less pronounced in the public and in the private sector in East than in West Germany. Male and female workers working in sector O earn roughly equal wages in the East, while in sector P the pay gap between 2010 and 2014 has turned in favour of men. The public sector offers women attractive earning opportunities, especially in the eastern German federal states, compared to the private economy. This, combined with a comparatively high concentration of East German female workers in the public sector, contributes to the significantly lower East German gender pay gap compared to the West German level.

Managerial positions in the public and in the private sector are dominated by men and show pay gaps in favour of men. Lower performance groups are characterized by a higher proportion of women as well as lower earnings disadvantages or slight earnings advantages of women.

The gender pay gap is dominated by the explained part. The wage advantage of women over men among part-time workers, both in the public and in the private sector, is due to the relatively high proportion of marginally and temporarily employed workers and the relatively short firm tenure among men. The explained part of the gender pay gap among full-time workers is driven by the performance group. The findings once again underline the need to review gender-based access to leading positions in the public sector. A central role is played by the appraisal system (see also dbb 2017). Especially in sector P, the proportion of managerial positions among men is higher than among women. The wage gap can be explained to a lesser extent by the different characteristics of men and women in the eastern than in the western part of Germany. In the sectors O and P, there is hardly an explained gap in the East.

Except for managerial workers, the explained part of the pay gap in the public sector operates in favour of women. In the private sector, on the other hand, the explained part in all performance groups increases the gender pay gap. The detailed decomposition of the explained part for all workers reveals that the advantageous distribution of performance groups and levels of education, as well as the lower rate of part-time employment among men, explains their earnings advantage. In the private economy, men also benefit from their employment in wage-attractive sectors.

References

Battis, U. (2017): Geschlechterbedingte Diskriminierung im öffentlichen Dienst: Ein Blick auf das Dienstrecht, in: dbb – Deutscher Beamtenbund und Tarifunion - Bundesfrauenvertretung (Hrsg.): Frauen 4.0: Diskriminierungsfreies Fortkommen im öffentlichen Dienst – Jetzt umdenken!, Juli 2017, Berlin.

Boll, C.; Leppin, J. (2015): Die geschlechtsspezifische Lohnlücke in Deutschland: Umfang, Ursachen und Interpretation, Wirtschaftsdienst 95 (4), 249-254.

Boll, C., Leppin, J., Rossen, A., Wolf, A. (2016): Magnitude and Impact Factors of the Gender Pay Gap in EU Countries, Report prepared for and financed by the European Commission – Directorate-General for Justice, European Union (Hrsg.), Hamburg.

Bundesministerium des Innern (BMI, Hrsg.) (2001): Teilzeitbeschäftigung im öffentlichen Dienst, Oktober 2001.

Bundesministerium für Familie, Senioren, Frauen und Jugend (BMFSFJ, Hrsg.) (2009): Der Verdienstunterschied zwischen Frauen und Männern im öffentlichen Bereich und in der Privatwirtschaft, Berlin, September 2009.

dbb – Deutscher Beamtenbund und Tarifunion - Bundesfrauenvertretung (Hrsg.): Frauen 4.0: Diskriminierungsfreies Fortkommen im öffentlichen Dienst – Jetzt umdenken!, Juli 2017, Berlin.

Drahs, S., Schneider, U., Schrauth, P. (2015): Geplante und tatsächliche Erwerbsunterbrechungen von Müttern, DIW Roundup, S. 5.

Forschungsdatenzentrum der Statistischen Ämter der Länder (2016): Metadaten zur Verdienststrukturerhebung 2014, EVAS 62111, Teil II – On-Site-Material.

Gesetz zur Durchsetzung der Gleichstellung von Männern und Frauen (DGleiG), zur Verfügung gestellt vom BMFSFJ unter https://www.bmfsfj.de/blob/84392/dfcbafb6b7792e272b1c59e33c9b6942/prm-13097-gesetz-zur-durchsetzung-der-gl-data.pdf

RWI (Rheinisch-Westfälisches Institut für Wirtschaftsforschung) (2016): Risiken atypischer Beschäftigungsformen für die berufliche Entwicklung und Erwerbseinkommen im Lebensverlauf. Berlin: Bundesministerium für Arbeit und Soziales (Hrsg.).

Statistisches Bundesamt (Destatis) (2018): Startseite/Zahlen&Fakten/Indikatoren/Gender Pay Gap, abgerufen am 21.01.2018 unter https://www.destatis.de/DE/ZahlenFakten/Indikatoren/QualitaetArbeit/QualitaetDerArbeit.html

Statistisches Bundesamt (Destatis) (2015): Verdienstunterschied zwischen Frauen und Männern in Deutschland weiterhin bei 22 %, Pressemitteilung Nr. 99/2015 vom 16. März 2015.

Statistisches Bundesamt (Destatis) (2014): Gender Pay Gap 2013 bei Vollzeitbeschäftigten besonders hoch, Pressemitteilung Nr. 104 vom 18.03.2014.

Statistisches Bundesamt (Destatis) (2010): Verdienstunterschiede zwischen Männern und Frauen, Studie im Auftrag des Bundesministeriums für Familie, Senioren, Frauen und Jugend, Wiesbaden.

Appendix

Table A1:

Oaxaca-Blinder-Decomposition of the Unadjusted Gender Pay Gap, Sector O, 2014

	Koeffizient	Standardfehler	P>|z|
Total			
Men	2.965	0.002	0.000
Women	2.896	0.002	0.000
Difference	0.069	0.003	0.000
Explained Part	0.049	0.004	0.000
Unexplained Part	0.019	0.003	0.000
Explained Part			
Occupation (EF42) (Reference: Clerical Support Workers)			
Managers	0.002	0.000	0.000
Professionals	0.001	0.000	0.000
Technicians and Associate Professionals	-0.008	0.001	0.000
Services and Sales Workers	0.004	0.000	0.000
Skilled Agricultural, Forestry and Fishery Workers	0.000	(omitted)	
Craft and Related Trades Workers	0.000	0.000	0.774
Plant and Machine Operators and Assemblers	0.000	0.000	0.632
Elementary Occupations	0.000	0.000	0.481
Armed Forces Occupations	0.013	0.001	0.000
Civil Servants (EF16u1)	-0.017	0.001	0.000
Education (EF43) (Reference: High Educational Level)			
Low Educational Level	-0.002	0.001	0.009
Medium Educational Level	0.012	0.001	0.000
Small-Scale Part-Time (EF52)	0.001	0.003	0.787
Large-Scale Part-Time (EF52)	0.004	0.001	0.000
Fixed-Term Contract (EF17)	-0.003	0.000	0.000
Performance Group (EF9) (Reference: Skilled Workers)			
Workers in Managerial Positions	0.026	0.001	0.000
Workers in Senior Positions	0.005	0.001	0.000
Semi-Skilled Workers	-0.010	0.002	0.000
Unskilled Workers	0.011	0.001	0.000
Marginally Employed Workers (EF17)	0.008	0.001	0.000
Firm Tenure (EF40)	0.000	0.001	0.816
Potential Employment Experience	-0.004	0.002	0.080
Potential Employment Experience, squared	0.003	0.002	0.087

Federal State (EF5) (Reference: Northrhine-Westphalia)			
Schleswig-Holstein	0.000	0.000	0.270
Hamburg	0.000	0.000	0.828
Lower Saxony	0.000	0.000	0.396
Bremen	0.000	0.000	0.364
Hesse	0.000	0.000	0.267
Rhineland Palatinate	0.000	0.000	0.262
Baden-Württemberg	0.000	0.000	0.004
Bavaria	0.000	0.000	0.212
Saarland	0.000	0.000	0.239
Berlin	0.000	0.000	0.000
Brandenburg	0.000	0.000	0.000
Mecklenburg Western Pomerania	0.000	0.000	0.721
Saxony	0.000	0.000	0.997
Saxony-Anhalt	0.000	0.000	0.000
Thuringia	0.000	0.000	0.006
Supplements (EF23)	0.000	(omitted)	
Unexplained Part			
Occupation (EF42) (Reference: Clerical Support Workers)			
Managers	0.000	0.000	0.360
Professionals	0.000	0.001	0.784
Technicians and Associate Professionals	0.000	0.002	0.810
Services and Sales Workers	0.002	0.000	0.000
Skilled Agricultural, Forestry and Fishery Workers	0.000	(omitted)	
Craft and Related Trades Workers	0.000	0.000	0.704
Plant and Machine Operators and Assemblers	0.000	0.000	0.263
Elementary Occupations	-0.001	0.001	0.376
Armed Forces Occupations	0.000	0.000	0.522
Civil Servants (EF16u1)	0.000	0.001	0.579
Education (EF43) (Reference: High Educational Level)			
Low Educational Level	0.001	0.003	0.697
Medium Educational Level	-0.013	0.003	0.000
Small-Scale Part-Time (EF52)	-0.003	0.003	0.285
Large-Scale Part-Time (EF52)	-0.008	0.001	0.000
Fixed-Term Contract (EF17)	0.004	0.001	0.000
Performance Group (EF9) (Reference: Skilled Workers)			
Workers in Managerial Positions	-0.001	0.001	0.349
Workers in Senior Positions	0.003	0.002	0.257
Semi-Skilled Workers	-0.001	0.001	0.568

Unskilled Workers	-0.004	0.001	0.003
Marginally Employed Workers (EF17)	-0.002	0.002	0.322
Firm Tenure (EF40)	0.001	0.028	0.963
Potential Employment Experience	0.109	0.032	0.001
Potential Employment Experience, squared	-0.042	0.009	0.000
Federal State (EF5) (Reference: Northrhine-Westphalia)			
Schleswig-Holstein	0.000	0.000	0.816
Hamburg	0.000	0.000	0.016
Lower Saxony	0.000	0.000	0.521
Bremen	0.000	0.000	0.000
Hesse	-0.001	0.000	0.143
Rhineland Palatinate	0.000	0.000	0.651
Baden-Württemberg	0.000	0.001	0.557
Bavaria	-0.001	0.001	0.398
Saarland	0.000	0.000	0.942
Berlin	-0.001	0.000	0.016
Brandenburg	0.000	0.000	0.058
Mecklenburg Western Pomerania	0.000	0.000	0.235
Saxony	0.000	0.000	0.089
Saxony-Anhalt	-0.001	0.000	0.004
Thuringia	0.000	0.000	0.357
Supplements (EF23)	0.000	(omitted)	
Constant	-0.022		
Number of Observations			
Total	142961		
Men	64757		
Women	78204		

Sources: Research Data Center of the Federal and State Statistical Offices (*FDZ der Statistischen Ämter des Bundes und der Länder*), Structure of Earnings survey (*Verdienststrukturerhebung*) 2014, own calculations.

Table A2:

Oaxaca-Blinder-Decomposition of the Unadjusted Gender Pay Gap, Sector P, 2014

	Koeffizient	Standardfehler	P>|z|
Total			
Men	3.061	0.004	0.000
Women	2.982	0.002	0.000
Difference	0.080	0.005	0.000
Explained Part	0.062	0.005	0.000
Unexplained Part	0.018	0.003	0.000
Explained Part			
Occupation (EF42) (Reference: Clerical Support Workers)			
Managers	0.007	0.001	0.000
Professionals	0.007	0.001	0.000
Technicians and Associate Professionals	-0.002	0.001	0.030
Services and Sales Workers	-0.001	0.000	0.000
Skilled Agricultural, Forestry and Fishery Workers	0.000	0.000	0.525
Craft and Related Trades Workers	0.000	0.000	0.025
Plant and Machine Operators and Assemblers	0.000	0.000	0.321
Elementary Occupations	0.001	0.000	0.000
Armed Forces Occupations	0.000	(omitted)	
Civil Servants (EF16u1)	0.000	0.000	0.035
Education (EF43) (Reference: High Educational Level)			
Low Educational Level	-0.002	0.001	0.244
Medium Educational Level	0.009	0.003	0.001
Small-Scale Part-Time (EF52)	-0.001	0.000	0.091
Large-Scale Part-Time (EF52)	0.009	0.001	0.000
Fixed-Term Contract (EF17)	-0.007	0.001	0.000
Performance Group (EF9) (Reference: Skilled Workers)			
Workers in Managerial Positions	0.082	0.005	0.000
Workers in Senior Positions	-0.015	0.002	0.000
Semi-Skilled Workers	0.002	0.000	0.000
Unskilled Workers	0.011	0.002	0.000
Marginally Employed Workers (EF17)	-0.009	0.001	0.000
Firm Tenure (EF40)	-0.024	0.003	0.000
Potential Employment Experience	-0.022	0.003	0.000
Potential Employment Experience, squared	0.016	0.002	0.000
Firm Size (EF10) (Reference: At Least 250 Workers)			
Less than 50	0.000	0.000	0.332

50 to 250	0.000	0.000	0.178
Not specified	0.000	0.000	0.737
Federal State (EF5) (Reference: Northrhine-Westphalia)			
Schleswig-Holstein	0.000	0.000	0.783
Hamburg	0.000	0.000	0.259
Lower Saxony	0.000	0.000	0.939
Bremen	0.000	0.000	0.040
Hesse	0.000	0.000	0.895
Rhineland Palatinate	0.000	0.000	0.019
Baden-Württemberg	0.000	0.000	0.822
Bavaria	0.000	0.000	0.376
Saarland	0.000	0.000	0.065
Berlin	0.000	0.000	0.771
Brandenburg	0.000	0.000	0.000
Mecklenburg Western Pomerania	0.000	0.000	0.787
Saxony	0.000	0.000	0.012
Saxony-Anhalt	0.000	0.000	0.323
Thuringia	0.000	0.000	0.500
Supplements (EF23)	0.000	0.000	0.164
Unexplained Part			
Occupation (EF42) (Reference: Clerical Support Workers)			
Managers	-0.002	0.000	0.000
Professionals	-0.055	0.012	0.000
Technicians and Associate Professionals	-0.010	0.003	0.002
Services and Sales Workers	-0.002	0.001	0.001
Skilled Agricultural, Forestry and Fishery Workers	0.000	(omitted)	
Craft and Related Trades Workers	0.000	0.000	0.261
Plant and Machine Operators and Assemblers	0.000	0.000	0.463
Elementary Occupations	-0.002	0.002	0.231
Armed Forces Occupations	0.000	(omitted)	
Civil Servants (EF16u1)	-0.001	0.002	0.486
Education (EF43) (Reference: High Educational Level)			
Low Educational Level	0.004	0.004	0.373
Medium Educational Level	-0.005	0.006	0.459
Small-Scale Part-Time (EF52)	-0.001	0.002	0.787
Large-Scale Part-Time (EF52)	-0.016	0.002	0.000
Fixed-Term Contract (EF17)	0.005	0.001	0.000
Performance Group (EF9) (Reference: Skilled Workers)			
Workers in Managerial Positions	0.028	0.007	0.000

Workers in Senior Positions	0.010	0.007	0.116
Semi-Skilled Workers	-0.002	0.001	0.182
Unskilled Workers	-0.011	0.003	0.000
Marginally Employed Workers (EF17)	0.001	0.001	0.491
Firm Tenure (EF40)	0.037	0.020	0.067
Potential Employment Experience	0.056	0.024	0.019
Potential Employment Experience, squared	-0.031	0.011	0.003
Firm Size (EF10) (Reference: At Least 250 Workers)			
Less than 50	0.000	0.001	0.984
50 to 250	0.001	0.001	0.189
Not specified	0.064	0.054	0.232
Federal State (EF5) (Reference: Northrhine-Westphalia)			
Schleswig-Holstein	0.000	0.000	0.535
Hamburg	0.000	0.000	0.214
Lower Saxony	0.000	0.001	0.889
Bremen	0.000	0.000	0.929
Hesse	0.000	0.001	0.836
Rhineland Palatinate	0.001	0.000	0.087
Baden-Württemberg	0.003	0.001	0.005
Bavaria	0.001	0.001	0.094
Saarland	0.000	0.000	0.008
Berlin	0.001	0.000	0.018
Brandenburg	0.000	0.000	0.518
Mecklenburg Western Pomerania	0.000	0.000	0.468
Saxony	0.001	0.000	0.001
Saxony-Anhalt	0.000	0.000	0.682
Thuringia	0.000	0.000	0.112
Supplements (EF23)	0.000	0.000	0.781
Constant	0.071		
Number of Observations			
Total	92094		
Men	35874		
Women	56220		

Sources: Research Data Center of the Federal and State Statistical Offices (*FDZ der Statistischen Ämter des Bundes und der Länder*), Structure of Earnings survey *(Verdienststrukturerhebung*) 2014, own calculations.

Table A3:

Oaxaca-Blinder-Decomposition of the Unadjusted Gender Pay Gap, Sectors O+P, 2014

	Koeffizient	Standardfehler	P>|z|
Total			
Men	2.994	0.002	0.000
Women	2.938	0.002	0.000
Difference	0.056	0.003	0.000
Explained Part	0.038	0.003	0.000
Unexplained Part	0.019	0.002	0.000
Explained Part			
Occupation (EF42) (Reference: Clerical Support Workers)			
Managers	0.004	0.000	0.000
Professionals	-0.003	0.000	0.000
Technicians and Associate Professionals	-0.003	0.000	0.000
Services and Sales Workers	0.001	0.000	0.025
Skilled Agricultural, Forestry and Fishery Workers	0.000	0.000	0.672
Craft and Related Trades Workers	0.000	0.000	0.133
Plant and Machine Operators and Assemblers	0.000	0.000	0.396
Elementary Occupations	0.001	0.000	0.000
Armed Forces Occupations	0.009	0.000	0.000
Civil Servants (EF16u1)	-0.008	0.000	0.000
Education (EF43) (Reference: High Educational Level)			
Low Educational Level	0.000	0.000	0.250
Medium Educational Level	0.008	0.001	0.000
Small-Scale Part-Time (EF52)	-0.001	0.001	0.461
Large-Scale Part-Time (EF52)	0.008	0.001	0.000
Fixed-Term Contract (EF17)	-0.005	0.000	0.000
Performance Group (EF9) (Reference: Skilled Workers)			
Workers in Managerial Positions	0.023	0.001	0.000
Workers in Senior Positions	0.002	0.000	0.000
Semi-Skilled Workers	-0.005	0.001	0.000
Unskilled Workers	0.012	0.001	0.000
Marginally Employed Workers (EF17)	-0.001	0.000	0.110
Firm Tenure (EF40)	-0.009	0.001	0.000
Potential Employment Experience	-0.004	0.001	0.000
Potential Employment Experience, squared	0.003	0.001	0.026
Sector (EF6) (Reference: P)			
O	0.006	0.000	0.000

Firm Size (EF10) (Reference: At Least 250 Workers)			
Less than 50	0.000	0.000	0.119
50 to 250	0.000	0.000	0.396
Not specified	0.000	0.000	0.721
Federal State (EF5) (Reference: Northrhine-Westphalia)			
Schleswig-Holstein	0.000	0.000	0.611
Hamburg	0.000	0.000	0.003
Lower Saxony	0.000	0.000	0.424
Bremen	0.000	0.000	0.022
Hesse	0.000	0.000	0.026
Rhineland Palatinate	0.000	0.000	0.028
Baden-Württemberg	0.000	0.000	0.000
Bavaria	0.000	0.000	0.000
Saarland	0.000	0.000	0.324
Berlin	0.000	0.000	0.048
Brandenburg	0.000	0.000	0.000
Mecklenburg Western Pomerania	0.000	0.000	0.530
Saxony	0.000	0.000	0.022
Saxony-Anhalt	0.000	0.000	0.003
Thuringia	0.000	0.000	0.035
Supplements (EF23)	0.000	0.000	0.276
Unexplained Part			
Occupation (EF42) (Reference: Clerical Support Workers)			
Managers	-0.001	0.000	0.000
Professionals	-0.020	0.002	0.000
Technicians and Associate Professionals	-0.009	0.001	0.000
Services and Sales Workers	0.001	0.000	0.005
Skilled Agricultural, Forestry and Fishery Workers	0.000	(omitted)	
Craft and Related Trades Workers	0.000	0.000	0.133
Plant and Machine Operators and Assemblers	0.000	0.000	0.536
Elementary Occupations	0.003	0.001	0.007
Armed Forces Occupations	0.000	0.000	0.862
Civil Servants (EF16u1)	-0.001	0.001	0.080
Education (EF43) (Reference: High Educational Level)			
Low Educational Level	-0.002	0.002	0.446
Medium Educational Level	-0.011	0.003	0.000
Small-Scale Part-Time (EF52)	-0.001	0.002	0.412
Large-Scale Part-Time (EF52)	-0.013	0.001	0.000
Fixed-Term Contract (EF17)	0.003	0.001	0.000

Performance Group (EF9) (Reference: Skilled Workers)			
Workers in Managerial Positions	0.015	0.002	0.000
Workers in Senior Positions	0.005	0.002	0.037
Semi-Skilled Workers	-0.001	0.001	0.212
Unskilled Workers	-0.007	0.001	0.000
Marginally Employed Workers (EF17)	0.001	0.001	0.238
Firm Tenure (EF40)	0.057	0.012	0.000
Potential Employment Experience	0.035	0.015	0.017
Potential Employment Experience, squared	-0.032	0.008	0.000
Sector (EF6) (Reference: P)			
O	0.007	0.001	0.000
Firm Size (EF10) (Reference: At Least 250 Workers)			
Less than 50	0.000	0.000	0.892
50 to 250	0.000	0.000	0.229
Not specified	0.083	0.056	0.137
Federal State (EF5) (Reference: Northrhine-Westphalia)			
Schleswig-Holstein	0.000	0.000	0.218
Hamburg	0.000	0.000	0.831
Lower Saxony	0.000	0.000	0.679
Bremen	0.000	0.000	0.064
Hesse	-0.001	0.000	0.017
Rhineland Palatinate	0.000	0.000	0.789
Baden-Württemberg	0.001	0.001	0.116
Bavaria	-0.001	0.001	0.221
Saarland	0.000	0.000	0.821
Berlin	0.000	0.000	0.477
Brandenburg	0.000	0.000	0.281
Mecklenburg Western Pomerania	0.000	0.000	0.925
Saxony	0.000	0.000	0.107
Saxony-Anhalt	0.000	0.000	0.063
Thuringia	0.000	0.000	0.645
Supplements (EF23)	0.000	0.000	0.998
Constant	-0.092	0.031	0.010
Number of Observations			
Total	235055		
Men	100631		
Women	134424		

Sources: Research Data Center of the Federal and State Statistical Offices (*FDZ der Statistischen Ämter des Bundes und der Länder*), Structure of Earnings survey (*Verdienststrukturerhebung*) 2014, own calculations.

Table A4:
Oaxaca-Blinder-Decomposition of the Unadjusted Gender Pay Gap, Private Economy, 2014

	Koeffizient	Standardfehler	P>|z|
Total			
Men	2.890	0.001	0.000
Women	2.650	0.001	0.000
Difference	0.240	0.002	0.000
Explained Part	0.190	0.002	0.000
Unexplained Part	0.050	0.002	0.000
Explained Part			
Occupation (EF42) (Reference: Clerical Support Workers)			
Managers	0.010	0.000	0.000
Professionals	0.007	0.000	0.000
Technicians and Associate Professionals	-0.006	0.000	0.000
Services and Sales Workers	0.005	0.000	0.000
Skilled Agricultural, Forestry and Fishery Workers	0.000	0.000	0.000
Craft and Related Trades Workers	-0.002	0.000	0.000
Plant and Machine Operators and Assemblers	-0.004	0.000	0.000
Elementary Occupations	0.009	0.000	0.000
Armed Forces Occupations	0.000	0.000	0.881
Civil Servants (EF16u1)	0.000	0.000	0.000
Education (EF43) (Reference: High Educational Level)			
Low Educational Level	0.005	0.000	0.000
Medium Educational Level	0.005	0.000	0.000
Small-Scale Part-Time (EF52)	0.015	0.001	0.000
Large-Scale Part-Time (EF52)	0.009	0.001	0.000
Fixed-Term Contract (EF17)	0.011	0.000	0.000
Performance Group (EF9) (Reference: Skilled Workers)			
Workers in Managerial Positions	0.027	0.000	0.000
Workers in Senior Positions	0.014	0.000	0.000
Semi-Skilled Workers	0.000	0.000	0.130
Unskilled Workers	0.006	0.000	0.000
Marginally Employed Workers (EF17)	0.020	0.001	0.000
Firm Tenure (EF40)	0.007	0.000	0.000
Potential Employment Experience	-0.006	0.001	0.000
Potential Employment Experience, squared	0.007	0.001	0.000
Sector (EF6) (Reference: 70_71_78_81_82 + 64_to_66_69_80 +53_61_to_63_79)			
Nace 10_to_13 + 14_15	0.000	0.000	0.000
Nace 16_to_18 + 58_to_60	0.000	0.000	0.000
Nace 26_to_27_33 + 19_to_22 + 23 + 29_30 + 31_32	0.011	0.000	0.000
Nace 24_25 + 28	0.009	0.000	0.000
Nace 45_46	0.001	0.000	0.000
Nace 47	0.005	0.000	0.000

Nace 49_to_52	-0.003	0.000	0.000
Nace 75_86_to_88	0.015	0.001	0.000
Nace 68_72_to_74_77_95 + 90_to_93_96	0.000	0.000	0.000
Nace 94	0.001	0.000	0.000
Nace B + 35_36 + 37_to_39	0.001	0.000	0.000
Nace F	0.002	0.000	0.000
Nace I	0.003	0.000	0.000
Firm Size (EF10) (Reference: At Least 250 Workers)			
Less than 50	-0.001	0.000	0.008
50 to 250	-0.001	0.000	0.000
Federal State (EF5) (Reference: Northrhine-Westphalia)			
Schleswig-Holstein	0.000	0.000	0.000
Hamburg	0.000	0.000	0.000
Lower Saxony	0.000	0.000	0.151
Bremen	0.000	0.000	0.000
Hesse	0.000	0.000	0.720
Rhineland Palatinate	0.000	0.000	0.158
Baden-Württemberg	0.000	0.000	0.000
Bavaria	0.000	0.000	0.000
Saarland	0.000	0.000	0.117
Berlin	0.001	0.000	0.000
Brandenburg	0.000	0.000	0.153
Mecklenburg Western Pomerania	0.001	0.000	0.000
Saxony	0.000	0.000	0.100
Saxony-Anhalt	0.001	0.000	0.000
Thuringia	0.000	0.000	0.000
Public Sector Influence (EF9)	0.000	0.000	0.434
Supplements (EF23)	0.003	0.000	0.000
Unexplained Part			
Occupation (EF42) (Reference: Clerical Support Workers)			
Managers	0.002	0.000	0.000
Professionals	0.009	0.001	0.000
Technicians and Associate Professionals	0.014	0.001	0.000
Services and Sales Workers	0.015	0.001	0.000
Skilled Agricultural, Forestry and Fishery Workers	0.000	0.000	0.004
Craft and Related Trades Workers	0.003	0.000	0.000
Plant and Machine Operators and Assemblers	0.004	0.000	0.000
Elementary Occupations	0.014	0.001	0.000
Armed Forces Occupations	0.000	0.000	0.561
Civil Servants (EF16u1)	0.000	0.000	0.001

Education (EF43) (Reference: High Educational Level)			
Low Educational Level	-0.003	0.001	0.000
Medium Educational Level	0.002	0.003	0.409
Small-Scale Part-Time (EF52)	-0.017	0.002	0.000
Large-Scale Part-Time (EF52)	-0.007	0.001	0.000
Fixed-Term Contract (EF17)	-0.004	0.001	0.000
Performance Group (EF9) (Reference: Skilled Workers)			
Workers in Managerial Positions	0.001	0.000	0.092
Workers in Senior Positions	0.000	0.000	0.657
Semi-Skilled Workers	0.001	0.000	0.030
Unskilled Workers	-0.002	0.000	0.000
Marginally Employed Workers (EF17)	-0.005	0.001	0.000
Firm Tenure (EF40)	-0.014	0.001	0.000
Potential Employment Experience	0.076	0.008	0.000
Potential Employment Experience, squared	-0.038	0.005	0.000
Sector (EF6) (Reference: 70_71_78_81_82 + 64_to_66_69_80 +53_61_to_63_79)			
Nace 10_to_13 + 14_15	0.004	0.000	0.000
Nace 16_to_18 + 58_to_60	0.001	0.000	0.000
Nace 26_to_27_33 + 19_to_22 + 23 + 29_30 + 31_32	0.001	0.000	0.029
Nace 24_25 + 28	-0.001	0.000	0.000
Nace 45_46	0.001	0.000	0.000
Nace 47	-0.003	0.001	0.000
Nace 49_to_52	-0.001	0.000	0.000
Nace 75_86_to_88	-0.009	0.001	0.000
Nace 68_72_to_74_77_95 + 90_to_93_96	0.002	0.000	0.000
Nace 94	-0.001	0.000	0.000
Nace B + 35_36 + 37_to_39	0.000	0.000	0.420
Nace F	0.001	0.000	0.000
Nace I	-0.001	0.000	0.000
Firm Size (EF10) (Reference: At Least 250 Workers)			
Less than 50	-0.006	0.001	0.000
50 to 250	-0.008	0.001	0.000
Federal State (EF5) (Reference: Northrhine-Westphalia)			
Schleswig-Holstein	0.000	0.000	0.106
Hamburg	0.000	0.000	0.890
Lower Saxony	0.000	0.000	0.451
Bremen	0.000	0.000	0.024
Hesse	-0.001	0.000	0.079
Rhineland Palatinate	0.000	0.000	0.079
Baden-Württemberg	0.004	0.001	0.000
Bavaria	-0.003	0.001	0.000
Saarland	0.000	0.000	0.030

Berlin	-0.001	0.000	0.000
Brandenburg	-0.001	0.000	0.000
Mecklenburg Western Pomerania	0.000	0.000	0.002
Saxony	-0.002	0.000	0.000
Saxony-Anhalt	0.000	0.000	0.004
Thuringia	-0.001	0.000	0.000
Public Sector Influence (EF9)	-0.003	0.000	0.000
Supplements (EF23)	0.000	0.001	0.433
Constant	0.031	0.006	0.000
Number of Observations			
Total	601958		
Men	340187		
Women	261771		

Sources: Research Data Center of the Federal and State Statistical Offices (*FDZ der Statistischen Ämter des Bundes und der Länder*), Structure of Earnings survey *(Verdienststrukturerhebung*) 2014, own calculations.

The **Hamburg Institute of International Economics (HWWI)** is an independent economic research institute that carries out basic and applied research and provides impulses for business, politics and society. The Hamburg Chamber of Commerce is shareholder in the Institute whereas the Helmut Schmidt University / University of the Federal Armed Forces Hamburg is its scientific partner. The Institute also cooperates closely with the HSBA Hamburg School of Business Administration.

The HWWI's main goals are to:

- Promote economic sciences in research and teaching;
- Conduct high-quality economic research;
- Transfer and disseminate economic knowledge to policy makers, stakeholders and the general public.

The HWWI carries out interdisciplinary research activities in the context of the following research areas:

- Digital Economics
- Labour, Education & Demography
- International Economics and Trade
- Energy & Environmental Economics
- Urban and Regional Economics

Hamburg Institute of International Economics (HWWI)

Oberhafenstr. 1 | 20097 Hamburg | Germany
Telephone: +49 (0)40 340576-0 | Fax: +49 (0)40 340576-150
info@hwwi.org | www.hwwi.org