Gender pay gap varies greatly by occupation
The discrepancy in pay between men and women has become a hotly debated topic in the political arena. The German Federal Statistical Office (*Statistisches Bundesamt*) documented the extent of the “unadjusted” pay gap, which has hovered around 21 to 23 percent in the years 2006 to 2016.¹ The gender pay gap widens considerably over the course of professional careers, and for income over a lifetime the gender lifetime earnings gap is just under 50 percent.² After people retire, the difference in pay continues in the form of the gender pension gap, which measures the gender-specific difference in pension levels. Current calculations document that the gender pension gap is a major problem—particularly in Germany. In 2014, it was 42 percent in western Germany and 23 percent in eastern Germany.³

The “adjusted” pay gap is often a topic of discussion.⁴ This term describes the unexplained portion of the gender pay gap and accounts for differences in characteristics in the earning estimate such as: professional experience, education, sector, profession, company size, number of hours worked, tasks, hierarchy level, and type of employment contract. According to the German Federal Statistical Office, the adjusted pay gap equals six percent.⁵


³ Markus M. Grabka et al., “Der Gender Pension Gap verstärkt die Einkommensungleichheit von Männern und Frauen im Rentenalter,” *DIW Wochenbericht* no. 5 (2016): 87-96 (available online). See also the article by Anna Hammenschmid, Peter Haan and Carla Rowold in this issue.

⁴ For a discussion of the terms “adjusted pay gap” and “unadjusted pay gap,” see the term “gender pay gap” in the DIW Glossary (available online).


The German labor market is characterized by marked occupational segregation between women and men. The median earnings in female dominated occupations are lower than those in male dominated professions. This is one of the reasons for the gender pay gap. However, there are also large differences in earnings between men and women within occupations. These profession-specific gender pay gaps are smaller in professions with a high proportion of employees in the public sector. This finding indicates that more transparency with respect to earnings could reduce the gender pay gap in the private economy.
The characteristics of number of hours worked, profession, and vertical segregation explain the pay gap to a large extent. This fact is often used to argue that the pay gap between men and women stems from different sets of decisions and is therefore possibly driven by different preferences. However, choice of profession and number of hours worked are not only expressions of preference. They are also the consequences of societal and institutional norms and restrictions.6

German labor market shows marked professional segregation between men and women

The German labor market is heavily segregated by gender. As a study of the Institute for Employment Research (IAB) of the Federal Employment Agency documented,7 in 2010 a total of 60 percent of women worked in female dominated, 29 percent in mixed gender, and 11 percent in male dominated occupations. “Female dominated occupations” refer to those in which the proportion of women is over 70 percent, and “male dominated occupations” refer to those with a proportion of women of less than 30 percent. All other occupations are defined as mixed gender professions.

In total, 69 percent of men work in male dominated occupations, 20 percent in mixed gender occupations, and 11 percent in female dominated occupations. The IAB study also showed that there was virtually no change in the distribution of women and men among female dominated, male dominated and gender mixed professions between 1976 and 2010 in western Germany. Further studies document a similar relationship nationwide between 1993 and 2010.8

A current evaluation of the sample of the 2014 IAB data, Sample of Integrated Labour Market Biographies (SIAB) (Box), showed that not even half (13) of the 30 most frequently cited professions9 are mixed gender professions (Figure 1). With a proportion of women of more than 80 percent, stenographers, kindergarten teachers, and doctor’s office assistants are among the typical women’s professions. Lathe operator, electrical installer, and truck repairman are all professions with an average proportion

9 Civil servants and the self-employed were excluded from our analyses.
of women of less than three percent, making them men’s professions. Nursing care assistants, shop assistants, and office workers are all typical mixed gender professions.

**Gross wages in male dominated occupations are significantly higher than in female dominated occupations**

Based on the SIAB data, we were able to calculate the median wages paid within individual professions. The median wage is the wage at the 50th percentile of the wage distribution: it is the value with the same number of people with a higher and a lower wage. There is a difference between median wage and average wage, the former being more robust against outliers. Since wages at the upper end of the distribution have to be estimated, the median wage is preferable to the average wage. In order to compare the difference in earnings among and within occupations, we use the median wage in our analyses.

In general, professions with a higher proportion of women have lower median wages than professions with a lower proportion of women (Figure 2). The five professions with the highest median wages are all men’s professions: entrepreneur, company manager, engineer, IT specialists, and banking and insurance specialists. Ranking the 30 most common professions according to median earnings, the best-paid women’s profession is number 14 (nurse, midwife), followed by stenographer.

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10 A problem with KldB 88, the official classification of all professions, is that the industrial professions are intricately subdivided, while many different service and administrative professions are grouped into one three-digit level. See Britta Mathies, Carola Burkert, and Wolfgang Biessack, “Berufssegmente – eine empirisch fundierte Neuausgrenzung vergleichbarer beruflicher Einheiten,” IAB Discussion Paper 35 (2008). To counteract the problem, the profession of office assistant has been subdivided according to educational level (as per Ann-Christin Hausmann et al., “Männer- und Frauendomänen.”). However, based on the data at hand, the proportion of women can only be calculated for the overall profession.

11 The SIAB data are based on reports from employers that report wages only up to the contribution assessment ceiling. See Manfred Antoni, Andreas Ganz, and Philipp vom Berge, “Sample of Integrated Labour Market Biographies (SIAB) 1975–2014,” TFEZ: Datenreport 04/2016 (2016). We imputed the wages above the ceiling.

12 Each of the median wages refers to a daily wage. The SIAB data used here do not provide information about hours worked. They only indicate whether the person worked full- or part-time. For this reason, we could only calculate daily wages and not hourly ones. To be able to ensure that the wages are nevertheless comparable, people who work part-time were excluded from the analysis (see box).


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**Box**

**Sample of Integrated Labour Market Biographies (SIAB)**

The SIAB sample is an administrative data set provided by the Institute for Employment Research (IAB) of the Federal Employment Agency. It is a two-percent sample drawn from the Integrated Employment Biographies population, which contains the complete employment history of more than 1.75 million individuals.

The size of the SIAB sample gives it a key advantage in comparison to other data sets: for 2014 alone, the data set contained more than 764,000 observations. As a result of the administrative data collection process, the data set has no missing values, and its information on gross pay is accurate to the day. However, the SIAB does not record working hours, which means that part-time employees must be excluded from the comparison of daily pay in order to avoid distorting the results. And due to the administrative data collection process, the data set does not contain any information outside employer reports (no family status, number of children, or partner’s pay, for example).

**Definition: Profession**

We based our definition of “profession” on the 3-digit level of Klassifikation der Berufe 1988 (KldB 88), a scheme for classifying professions in which they are allocated to groups based on the knowledge, skills, and experience required. For example, the system differentiates between human and veterinary medicine but not between surgeons and pediatricians. In effect, the classification makes it possible to differentiate between professions requiring different skill levels. This is important when comparing the pay in heterogeneous professions.

On the other hand, the classification cannot be used to examine how genders are divided into subgroups of professions. This means, for example, that within the profession of human medicine, we could not observe whether men and women segregate themselves into different areas of specialization. That means the gender pay gap within a profession can be traced to two factors, but differentiation is not possible. Men and women may work in subgroups of a profession that are paid differently; then again this could involve discrimination.
at number 15. The other women’s professions are numbers 18 (kindergarten teacher), 19 (social worker), and 27 (doctor’s office assistant).

In summary, we can state than in the upper part of the pay distribution, male dominated professions predominate while female dominated professions are found in the lower half of the distribution. The professions with the lowest wages (waitress, waiter, steward, room and domestic cleaners, and cooks) are mixed gender professions.

Many studies have examined the causes of the systematically lower pay observed in women’s professions in comparison to men’s. The devaluation hypothesis rests on the assumption that society attributes different competencies to women and men. According to this hypothesis, women are ascribed to have strengths in housework and family duties, while men are ascribed to be more productive in gainful employment. For this reason, women and the professions in which most of them work have a lower status and are thus poorly paid.\(^{14}\) Further, inequality of pay between men’s and women’s professions can arise as a result of differences in human resources requirements. For example, the theory of compensating differentials claims that lower wages compensate for better possibilities to reconcile work and family duties in female dominated professions.\(^{15}\) The theory also suggests that fewer specific human resources are required in female dominated occupations professions than in those that are male dominated. This specialization leads to higher pay in the latter occupations.\(^{16}\)


**Figure 2**

**Share of women and median wage in the 30 most frequent occupations**

Note: The calculations are solely based on full-time employed persons. The assignment to the respective occupations is based on the Klubb 88. The translation of the German professional titles refers to the BiBB.

Source: Authors’ own calculations based on the SIAB data for 2014.

Median wages are in general higher in male-dominated than in female dominated occupations.
Gender pay gap also evident within professions

The previous analyses showed that in general, the pay in typical male dominated occupations is higher than that in female dominated occupations: part of the gender pay gap is due to the gender differences in occupational “choice”. However, we also find that gender pay gaps exist within occupations (Figure 3).17

Indeed, nine professions show a pay gap that is greater than the average unadjusted pay gap of 22 percent. These nine professions include male and female dominated as well as gender mixed occupations. For example, at 43 percent, the profession with the highest proportion of women (doctor’s office assistant) has the highest gender pay gap among the 30 most common professions. But even some male dominated professions show a very wide gender pay gap, for example, lathe operators and metal processors (28 percent each). The same applies to mixed professions. The pay structures of some also exhibit above-average gender pay gaps: salesperson (29 percent), banking specialists (25 percent), and bookkeepers (24 percent). The gender pay gap in the best-paid profession (entrepreneur, company manager) is 23 percent, which is also slightly above the average. This confirms the findings of current studies showing that overall the gender pay gap is significantly larger in the upper part of the income distribution than in the middle and lower parts.18 Further, earlier studies have found that the unexplained portion of the gender pay gap is increasing in the upper income range, which can be interpreted as a greater level of discrimination (glass ceiling).19

Some professions have a very low gender pay gap or none at all. This is the case in the male dominated occupation truck repairman, and in the female dominated occupation kindergarten teacher. In the mixed gender profession waitress, waiter, steward, the female dominated occupation nurse or midwife, and the male dominated occupations machine fitter and IT specialist, the gender pay gap is below ten percent.

Figure 3

Gender Pay Gap and share of women in the 30 most frequent occupations

In percent

Note: The calculations are solely based on full-time employed persons. The assignment to the respective occupations is based on the KlUB BB. The translation of the German professional titles refers to the BiBB. The Gender Pay Gap corresponds to the difference between the median wages of men and women in relation to the median wage of men.

Source: Authors’ own calculations based on the SIAB data for 2014.

The Gender Pay Gap varies strongly between occupations.


19 For example Francine D. Blau and Lawrence M. Kahn, “The Gender Wage Gap.”


21 Previous analyses of the Federal Statistical Office did not find a significant correlation between the gender pay gap and the share of women working in an industry (see Claudia Finke (2010): a. a. O.).


23 Claudia Finke (2010): a. a. O.

24 These numbers are based on a weighted evaluation of the Socio-Economic Panel (SOEP) v32, 2014.

Based on data for the US, it has been shown that the gender pay gap is particularly low in professions in which flexible working hours are possible. Using the proportion of part-time employees as a measure of flexibility, we were unable to find a correlation with the gender pay gap in Germany. However, it must be noted that the proportion of part-time employment in a profession is not necessarily an indication of employees’ time sovereignty or the extent to which management positions can be held without compulsory presence. For example, earlier studies in the US identified the financial sector as one with a very large gender pay gap and at the same time, a lower likelihood of women holding management positions. With regard to that sector, the same holds true for Germany.

Our findings indicate a need for more research into the causes of the different levels of the gender pay gap within individual professions in Germany. Although many studies have analyzed the causes of lower pay in female dominated in comparison to male dominated occupations, little research has been done to answer the question of why the gender pay gap is much higher in some professions than in others.

The results suggest that more transparency in wage negotiations would lead to lower differences in pay between men and women.29 The Remuneration Transparency Act (Entgelttransparenzgesetz, EntgTranspG) can be viewed as a step in that direction.30 And a change in corporate culture—away from overtime and compulsory presence to more employee control over working hours and flexible career models—could lead to more equal opportunity for men and women in the labor market, closing the gender pay gap in the process.

29 Linda Babcock and Sara Laschever, Women Don’t Ask.
30 The German Women Lawyers Association initiated a series of proposals for improving the Remuneration Transparency Act with the goal of actually implementing a legal right to equal pay for women and men for the same or similar work. See German Women Lawyers Association, “Stellungnahme des Deutschen Juristinnenbundes,” (Web page, German Women Lawyers Association, Berlin, March 6, 2017) (available online).