Demystifying the Gender Pay Gap

Evidence From Glassdoor Salary Data

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Executive Summary

This study examines the gender pay gap using a unique data set of hundreds of thousands of Glassdoor salaries shared anonymously by employees online. Unlike most studies, we include detailed statistical controls for specific job titles and company names. We estimate the gender pay gap in five countries: the United States, the United Kingdom, Australia, Germany and France.

- MAIN TAKEAWAY:
  The gender pay gap is *real*, both in the U.S. and around the world. Men earn more than women on average in every country we examined, both before and after adding statistical controls for personal characteristics, job title, company, industry and other factors designed to make an apples-to-apples comparison between workers.

- HOW LARGE IS THE GAP?
  Based on more than 505,000 salaries shared by full-time U.S. employees on Glassdoor, men earn 24.1 percent higher base pay than women on average. In other words, women earn about 76 cents per dollar men earn. This is consistent with official sources that show women earn on average 75 to 80 cents per dollar earned by men.[1] However, comparing workers with similar age, education and years of experience shrinks that gap to 19.2 percent. Further, comparing workers with the same job title, employer and location, the gender pay gap in the U.S. falls to 5.4 percent (94.6 cents per dollar).

- We find a similar pattern in all five countries we examined: a large overall or "unadjusted" gender pay gap, which shrinks to a smaller "adjusted" pay gap once statistical controls are added.

Country	"UNADJUSTED" GENDER PAY GAP		"ADJUSTED" GENDER PAY GAP	
	Average Cents/Pence Earned by Women Per Dollar/Pound/Euro of Male Earnings	Percentage Male Pay Advantage	Average Cents/Pence Earned by Women Per Dollar/Pound/Euro of Male Earnings	Percentage Male Pay Advantage
United States	75.9 cents	24.1%	94.6 cents	5.4%
United Kingdom	77.1 pence	22.9%	94.5 pence	5.5%
Australia	82.7 cents	17.3%	96.1 cents	3.9%
Germany	77.5 cents	22.5%	94.5 cents	5.5%
France	85.7 cents	14.3%	93.7 cents	6.3%

[1]   See for example DeNavas-Walt and Bernadette Proctor (2015).

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- **WHAT IT MEANS:**
  Although the "adjusted" gender pay gap is smaller than the often-cited comparison of average male and female pay, it remains an important and statistically significant gap. It persists even after comparing men and women with the same job title, at the same company, and with similar education and experience—a large gap that is clear in the data.

- **WHAT EXPLAINS THE GAP?**
  To drill down further into what's causing the gender pay gap, we look at the numbers in a slightly different way. We divide the overall gap into an "explained" part due to differences between workers, and an "unexplained" part due either to workplace bias—whether intentional or not—or unobserved worker characteristics. In all countries, most of the gender pay gap is explained. The "unexplained" part is 33 percent in the U.S. and is less than half in every country, suggesting *overt discrimination alone does not explain most of today's gender pay gap.*

Country	"Explained" Part of Gender Pay Gap Due to Worker Differences	"Unexplained" Part of Gender Pay Gap (Possible Workplace Gender Bias)
United States	67%	33%
United Kingdom	64%	36%
Australia	61%	39%
Germany	51%	49%
France	71%	29%

- **WHAT'S THE MAIN CAUSE?**
  The single biggest cause of the gender pay gap is occupation and industry sorting of men and women into jobs that pay differently throughout the economy. In the U.S., occupation and industry sorting explains 54 percent of the overall pay gap—by far the largest factor. For example, Census figures show women make up only 26 percent of highly paid chief executives but 71 percent of low-paid cashiers. Past research suggests this is due partly to social pressures that divert men and women into different college majors and career tracks, or to other gender norms such as women bearing disproportionate responsibility for child and elderly care, which pressures women into more flexible jobs with lower pay.[2]

- **WHAT'S NOT THE MAIN CAUSE?**
  Differences in level of education, age and experience between men and women—what economists call "human capital"—explain little of the gender pay gap. In the countries we examined, these factors explain between 14 percent and 26 percent of the gender pay gap, a finding that's consistent with academic literature.[3]

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[2] See for example Goldin (2015).
[3] See for example Blau and Khan (2016).

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- INDUSTRY MATTERS.
  The gender pay gap varies by industry. In the U.S., the "adjusted" gender pay gap is largest in the health care, insurance, mining & metals, transportation & logistics, and media industries. It is smallest in aerospace & defense, agriculture & forestry, biotech & pharmaceuticals, travel & tourism, and restaurants, bars & food service industries. Although many tech jobs display large gender pay gaps, the overall information technology (or "tech") industry is close to the U.S. average and falls in the middle of the pack among industries.

- OCCUPATION MATTERS.
  The gender pay gap varies widely by occupation. In general, many tech and health care jobs top the list for largest gender pay gaps. In the U.S., the "adjusted" gender pay gap is largest for computer programmer, chef, dentist, C-suite professionals, psychologist, pharmacist, and CAD designer occupations. The gender pay gap is smallest for social worker, merchandiser, research assistant, purchasing specialist, physician advisor, and communications associate occupations.

- PAY GAP GROWS WITH AGE.
  Younger workers face a smaller gender pay gap than older workers. In the U.S., young workers aged 18 to 24 years face a small "adjusted" gender pay gap of 2.2 percent. By contrast, older workers aged 55 to 64 years face a gender pay gap of 10.5 percent, roughly double the national average.

- STEADY OVER TIME.
  The U.S. "adjusted" gender pay gap in Glassdoor salary data has remained essentially unchanged at roughly 4 to 6 percent since the late 2000s. Academic research has found that although the male-female pay gap has shrunk dramatically since the 1960s, the rate of convergence has slowed in recent decades—a stagnation that is consistent with Glassdoor pay data.

- WHAT POLICIES CAN HELP?
  Workplace fairness and anti-discrimination remain important issues. But the data show that while overt forms of bias may be a partial cause of the gender pay gap, they are not likely the *main* driver. Instead, *occupation and industry sorting* of men and women into systematically different jobs is the main cause. Public policies that help remove social barriers to allow for equality in occupational choices can help shrink the gender pay gap. This includes policies that alleviate social pressures that divert men and women into different college majors and career tracks, and that burden women with a disproportionate share of the responsibility for child-care and elderly caregiving duties.

- PAY TRANSPARENCY MATTERS.
  Research shows that employer policies that embrace salary transparency can help eliminate hard-to-justify gender pay gaps and can play an important role in helping achieve balance in male-female pay in the workplace.

I. Introduction

It is a well-established fact that men and women are paid unequally. In the U.S., U.K. and around the world, figures for average pay reveal stark differences between male and female earnings. In the U.S., women on average earn around 21.4 percent lower pay than men, a figure that amounts to women earning roughly 79 cents on average for each dollar earned by men in the labor market.[4] This pattern of male pay advantage is a truly global phenomenon: Across the 28 member countries of the European Union, women earn on average 16.4 percent lower pay than men.[5]

But what's behind these gaps in average pay? Simple comparisons of male and female earnings ignore many important differences between men and women that affect wages. Differences in education, years of experience, job type, and industry all affect wages, and gender pay gaps can arise from many different factors. Some factors are clearly negative—and illegal—such as overt workplace bias and discrimination. By contrast, some factors are larger systemic issues, reflecting the sorting of female workers into jobs offering greater flexibility but lower pay. These direct and indirect causes matter when assessing what the gender pay gap means and what policies can work best to close it.

As a first step, it's important to make an apples-to-apples comparison of similar workers when measuring the gender pay gap. As has been shown in many studies over the years,[6] once differences between men and women in terms of education, years of experience, jobs and industries are accounted for, the gap between male and female pay shrinks by as much as 50 to 75 percent. However, even in the most careful empirical studies we still find a statistically significant gender pay gap, after many statistical controls are applied.

The research shows that the gender pay gap is real and is one of most well established facts in labor economics today. The key questions that remain are:

- *How large is today's gender pay gap?*
- *What factors are causing it?*
- *What policies and programs can best target the causes?*

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[4] Data See DeNavas-Walt and Proctor (2015), available at http://gldr.co/1XAzBVZ.
[5] See Eurostat "Gender Pay Gap Statistics," available at http://gldr.co/1LcrZai.
[6] See for example, Blau and Khan (2016), Blau and Khan (2006), and CONSAD Research Corp. (2009). For reviews of the large academic literature on the economics of the gender pay gap, see Altonji and Blank (1999), Council of Economic Advisers (2016), and Liner (forthcoming).

Understanding Causes

In recent years there has been a dramatic improvement in our understanding of the gender pay gap. In early studies, many economists assumed all unexplained differences between male and female pay were caused by overt workplace discrimination.[7] But as research has accumulated, a more nuanced view has emerged. The *sorting of men and women into different occupations* has emerged as one of the main drivers of the gender pay gap—a factor that has little to do to with overt bias and reflects complex social pressures that divert women into some professions and away from others. Additionally, research has shown college major, gender differences in pay negotiation, and gender norms around caregiving and the resulting need for workplace flexibility are all important drivers of the gender pay gap[8]— none of which reflect overt discrimination. This points to the need for societal and public policy solutions that address these more subtle causes of gender pay differences.

The goal of this study is to use unique salary data from Glassdoor that includes anonymous pay data for specific job titles at specific companies to shed new light on patterns in today's gender pay gap—both in the U.S. and around the world. These data highlight important patterns in male-female pay across industries and occupations and can help identify the main causes of the gender pay gap. Ultimately, this research can help point the way toward more intelligent policy solutions that directly address underlying causes of the stark pay differences we observe today between men and women around the world.

What's New in This Study?

The unique contribution of this study is our *data*. We examine the gender pay gap using a large and never-before-studied data set of crowd-sourced salaries from Glassdoor. Unlike most official salary data from government surveys, Glassdoor salaries feature specific *job titles* and *employer names*, providing much more detail than broad occupations and industries available in most government data. This allows a more detailed analysis of how much of the gender pay gap is due to men and women sorting into different job titles and employers, even within the same industry or occupation—a key driver of the gender pay gap identified in past research.

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[7] See for example Oaxaca (1973).
[8] See for example Altonji and Blank (1999).

An additional unique feature of this study is its international scope. As an online platform, Glassdoor is a truly international jobs marketplace with content from 190 countries around the world. These data allow us to make comparisons of the gender pay gap internationally, based on identical surveys and data collection methods. We estimate the gender pay gap in five countries: the United States, the United Kingdom, Australia, Germany and France, offering a rare cross-country view of gender pay differences.

Although Glassdoor's data are relatively new, the statistical methods we use are not. This study uses conventional econometric methods that are common in labor economics literature. This has the advantage of allowing our results to be compared on a consistent basis with findings from the large academic literature on the gender pay gap. All of the details of our regression results are provided in the accompanying Appendix.[9]

We've organized the remainder of this study as follows. Section II explains our methodology for measuring the gender pay gap and identifying factors that explain it. Section III explains our unique data set of salaries from Glassdoor. Section IV presents the key findings of our study, showing estimates of the gender pay gap in the U.S. by industry, occupation, and age, and shows overall results for four other countries: the U.K., Australia, Germany and France. Section V explains limitations of our data to keep in mind. Finally, we conclude and offer suggestions for policies to help close the gender pay gap in Section VI.

II. Our Approach

Economists typically study the gender pay gap using two approaches. The first is designed to give an accurate measure of the gender pay gap, once we've made a fair comparison between workers with similar backgrounds and working in comparable jobs. The second is designed to go a step further and decompose these differences between male and female pay into the part we can explain with the data, and the part that remains unexplained—either due to unobserved factors or to subtle forms of gender bias in the workplace.

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[9] Appendix with complete tables of regression results is available at http://gldr.co/1MjfNjt.

Comparing Similar Workers

The first method uses what is known as "ordinary least squares" regression or OLS to carefully measure the size of the gender pay gap once we've compared statistically similar workers. This method starts with the raw or "unadjusted" gap in pay between men and women—the average male salary minus the average female salary— and then adds statistical controls to account for the impact of differences in education, years of experience, job title, industry and other factors.

To do this, we estimate the following equation on our full sample:

$$\underbrace{Y_i}_{\text{Salary}} = \underbrace{Male_i\,\beta_1}_{\text{Male Indicator}} + \underbrace{X_i\,\beta_2}_{\substack{\text{Worker and Job} \\ \text{Characteristics}}} + \varepsilon_i \qquad (1)$$

In equation (1), Y_i is the salary of worker i, $Male_i$ is a dummy equal to 1 for men and 0 for women, and X_i is a large collection of controls (known as "fixed effects") for everything we observe about workers, jobs and companies—including age, education, years of experience, state, year, industry, occupation, job title and company name. The term ε_i is the usual mean-zero error term.

The estimated coefficient on the male dummy term β_1 tells us the salary advantage experienced by males over females once all other factors are statistically adjusted for. This is known as the conditional or "adjusted" gender pay gap. In contrast to the raw difference between average male and female salaries, which ignores many important differences between workers, the "adjusted" pay gap gives a more balanced assessment of the pay gap once we do an apples-to-apples comparison.[10]

In terms of worker and job characteristics, Glassdoor salary data allow us to control for the following factors in our analysis: worker age, highest level of education, years of relevant work experience,[11] industry, occupation, company size, year, state,[12] job title and specific employer name.

Exploring What Factors Explain the Gap

Although this method helps carefully measure gender pay differences, it has an important limitation. First, it assumes the labor market treats men and women identically—that is, it assumes an extra year of experience, a college degree, or working in a particularly challenging job has an identical effect on pay for both men and women.[13] In reality, the labor market may reward men and women very differently, even when they have the same personal characteristics.

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[10] We estimate equation (1) using the natural log of salaries, so β_1 has the interpretation of being the approximate percentage male-female pay gap conditional on other statistical controls contained in X_i.
[11] It is conventional in the labor economics literature to also include a quadratic or "squared" experience term, and we follow that convention. This practice derives from classic Mincerian wage equations modeling the effect of work experience on wages as a hump-shaped quadratic relationship throughout workers' lifecycles.
[12] Due to the small geographic size of the United Kingdom, we use city-level controls for our gender pay gap estimates for the U.K., rather than the state-level controls used in all other countries.

Using a second method, we allow both worker characteristics and their "coefficients"—the estimated rewards the labor market gives to different worker characteristics—to vary. We are then able to decompose how much of the gender pay gap is explained by differences in worker and job characteristics, and how much is left "unexplained" because it reflects differences in the way the labor market rewards men and women who have identical characteristics in the data.[14]

This method is known as a Oaxaca-Blinder decomposition,[15] and is one of the most widely used methods in labor economics to detect the presence of group differences— and in some cases, estimate the magnitude of gender and racial discrimination— in the labor market.

Here's how it works. First, we divide our salary sample into male and female workers. Then we estimate two separate equations for how worker and job characteristics affect male and female salaries using OLS:

$$\underbrace{Y_M}_{\substack{\text{Male} \\ \text{Salary}}} = \underbrace{X_M \beta_M}_{\substack{\text{Male Worker and} \\ \text{Job Characteristics}}} + \varepsilon_M \qquad (2)$$

$$\underbrace{Y_F}_{\substack{\text{Female} \\ \text{Salary}}} = \underbrace{X_F \beta_F}_{\substack{\text{Female Worker and} \\ \text{Job Characteristics}}} + \varepsilon_F \qquad (3)$$

In words, equation (2) says that male wages (denoted Y_M) are explained by a set of male worker and job characteristics (contained in X_M) as well as the usual error (denoted ε_M). The term β_M is the set of male coefficients, which tells us how the labor market rewards men for their characteristics, such as education, experience, and industry. In equation (3) we estimate the same relationship for females, allowing the coefficients for women (denoted β_M) to differ from men.

The key insight in this approach is that in a world where men and women have identical labor market experiences, with no discrimination and all relevant characteristics of men and women are observed, the male and female coefficients in equations (2) and (3) should be identical. An additional year of experience, a college degree, or working in a challenging job should affect male wages in exactly the same way as female wages. All differences between men and women should be due to differences in characteristics in X, not coefficients contained in the β terms.

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[13] Estimating equation (1) on the full sample of data forces a single set of coefficients β_z to be shared by both males and females, rather than allowing worker and job characteristics contained in X_i to have different effects for men versus women.

[14] This is often referred to as "decomposing" the gender pay gap into the portion due to "characteristics" of workers (the Xs in equations 2 and 3) compared to "coefficients" (the βs in equations 2 and 3) that tell us the impact of worker characteristics on earnings.

[15] See Oaxaca (1973) and Blinder (1973). For a practical overview of how the Oaxaca-Blinder decomposition is implemented by researchers at the World Bank, see O'Donnell, Owen et al. (2008).

By subtracting equation (3) from equation (2) and taking the average across all workers,[16] we can express the difference between male and female pay as follows:

$$\underbrace{\overline{Y}_M - \overline{Y}_F}_{\text{Gender Pay Gap}} = \underbrace{\hat{\beta}_M(\overline{X}_M - \overline{X}_F)}_{\text{"Explained" Portion}} + \underbrace{\overline{X}_F(\hat{\beta}_m - \hat{\beta}_F)}_{\text{"Unexplained" Portion}} \quad (4)$$

Equation (4) gives the classic Oaxaca-Blinder decomposition.[17] On the left, we have the average difference between mean male and female salaries, $\overline{Y}_M - \overline{Y}_F$. On the right, we have two terms that divide this gender pay gap into an "explained" and "unexplained" portion.

The first term is the "explained" part. It shows how much of the gender pay gap is due to the difference between average male and female characteristics, or $\overline{X}_M - \overline{X}_F$, when men and women are assumed to be treated equally by the labor market and have the same set of coefficients, $\hat{\beta}_M$. This shows how much of the gender pay gap is due only to differences in worker characteristics.

The second term is the "unexplained" part. It shows how much of the gender pay gap is due to differences in the way labor markets treat men and women, or $\hat{\beta}_M - \hat{\beta}_F$, when men and women are assumed to have exactly the same set of average characteristics, $\overline{X}_F$. This is the part of the gender pay gap that's due to differences in male and female coefficients. Using this approach, we're able to identify key factors that explain—or don't explain—the gender pay gaps we observe around the world.

Why Use Logarithms of Pay?

In labor economics, it is conventional to use the natural logarithm or "log" of salaries in regression analyses, rather than raw dollar amounts. The reason is that it makes for easy interpretation of statistical results.

When the log of salary is regressed on worker characteristics (as in equation 1) the estimated coefficients give *the approximate percentage change in salary from a one-unit change in the explanatory factor*.

Thus, the coefficient on the "male" dummy variable in equation 1 gives the approximate percentage gender pay gap between male and female pay, holding all other worker characteristics constant. For this reason, we estimate all of our regressions in the log of salary.

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[16] This step requires adding and subtracting the term $X_F B_M$ and taking the expected value of the resulting expression. For a detailed discussion of this derivation, see Altonji and Blank (1999).

[17] This two-fold Oaxaca-Blinder decomposition can be done using male coefficients ($\hat{\beta}_M$), female coefficients ($\hat{\beta}_F$), or some linear combination of the two. In practice, we differ from the model in equation 4 in that we use a 50-50 equal weighting scheme between male and female coefficients. None of our results are materially affected by this choice of basis for the vector of non-discriminatory coefficients.

III. The Data We Use

We examine the gender pay gap using a unique data source: a large sample of Glassdoor salaries shared anonymously online by employees and former employees. Since 2008, Glassdoor has served as an online platform where employees can anonymously view and submit salaries, company reviews, interview reviews, benefits reviews, workplace photos and other information designed to encourage transparency in the labor market. Since its launch, Glassdoor has collected more than 11 million pieces of content from 190 countries, including several million salary reports collected online via user surveys.[18]

How We Collect Salaries

Unlike traditional labor market surveys, Glassdoor salary data are not collected through the use of a probability sample of a representative sample of workers. Instead, Glassdoor collects data via a decentralized "crowd-sourcing" platform, using a process known as a "give to get" model.[19]

During the job-search process, most workers today search online for jobs, salary or company information. According to the Pew Research Center, 54 percent of Americans have gone online to look for job information.[20] Typically this begins with a search engine. When employees encounter Glassdoor, they are given a limited preview of the site's full content. To gain complete access, users are encouraged to contribute to the Glassdoor community by submitting an anonymous salary, company review, interview review, benefits review or company photo. In this way, users "give" content to the online community to "get" access to job information provided by others. Aside from this request that users contribute content, use of Glassdoor's online jobs marketplace is completely free to users.

This model has proven to be a powerful mechanism for collecting crowd-sourced labor market information. More importantly, it helps overcome some of the selection biases that plague crowd-sourced reviews and online data. Rather than relying on users to passively contribute content, it provides a powerful economic incentive to complete salary and other surveys. This allows Glassdoor to reach a global audience: essentially anyone searching for job information online, anywhere. This provides a broad sample of salaries from online employees around the world.

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[18] Glassdoor salary reports are based on surveys administered to site visitors. The survey can be viewed online at http://gldr.co/1TzaIcS. It collects detailed information on job title, employer name, location, years of experience, full-time vs. part-time employment status, and base pay as well as all other forms of compensation including bonuses, tips, commissions, stock options and profit sharing. All submissions of this type of "user-generated content" are subjected to a rigorous approval process, including a combination of machine-learning and human review.

[19] Additional detail on Glassdoor's "give to get" policy is available at http://help.glassdoor.com/article/Give-to-get-policy/en_US/.

[20] See Pew Research Center, "Searching for Work in the Digital Era," available at http://gldr.co/20ViZIF.

Are the Data Representative?

An important limitation of Glassdoor data is to note that it is a sample from online employees, which is not necessarily representative of the overall labor market in the countries we examine. Traditional government surveys are based on a random sample of households, such as the U.S. Census Bureau's "Current Population Survey" which collects pay data via surveys of approximately 60,000 households.[21] In Glassdoor salaries, the sampling frame is the *population of workers looking for job and company information online*. Thus, we can only make valid statistical inferences about online employees, not necessarily offline workers.

How different is the population of online employees from the overall U.S. labor market? In Figure 1, we illustrate the broad representativeness of Glassdoor salary data. The figure compares the distribution of Glassdoor salaries to official government estimates from the "Current Population Survey," the most widely used official source for salaries in the U.S. The left panel shows the distribution of salaries for full-time U.S. workers in 2014.[22] The right panel shows the comparable distribution of Glassdoor full-time salaries in 2014.

Figure 1. Comparison of Census and Glassdoor Salaries for Full-Time Workers

Distribution of Census Salaries (2014)
Full-Time Workers

Person Earnings

■ Female □ Male
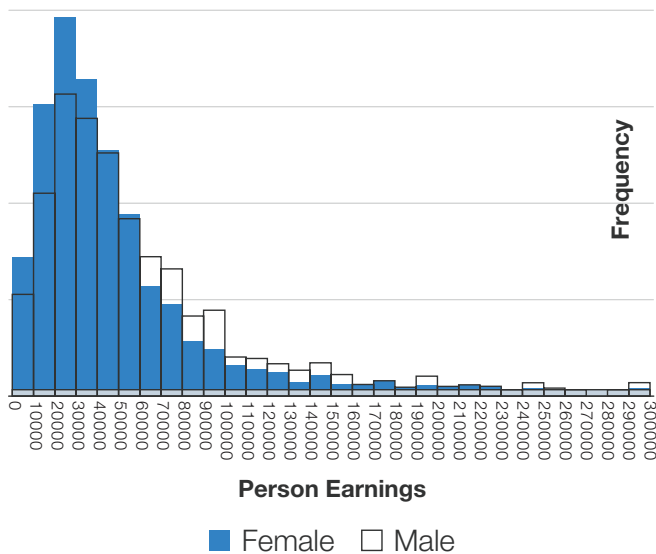
Distribution of Glassdoor Salaries (2014)
Full-Time Workers

Base Salary

■ Female □ Male
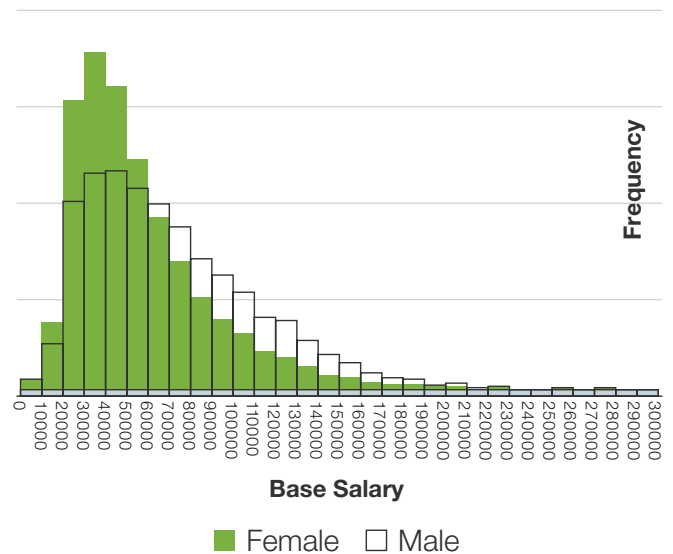
Source: Census 2015 March CPS (ASEC) file; Glassdoor Economic Research.
Notes: Salaries are for full-time workers only for calendar year 2014.

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21   See the U.S. Census Bureau's "Current Population Survey" methodology, at http://gldr.co/1Q0uCv2.
22   Data are from the public-use microdata file from the March "Annual Social and Economic Supplement" (known as CPS ASEC), available at http://gldr.co/1Um2iX9.

Interestingly, both follow an approximately "lognormal" distribution—a common pattern observed in incomes throughout the world[23]—with salaries clustered toward the low-end of the distribution coupled with a few very large salaries. In both panels, we see a clear overall gender pay gap between male and female earnings, with the male distribution significantly right-shifted compared to female pay. Overall, the distribution of Glassdoor salaries mirrors the distribution of U.S. salaries surprisingly well. This suggests the population of online employees today is not as different from the overall workforce as may have been true a decade ago.

There is one important difference to note between the distribution of Glassdoor and Census Bureau salaries. Because Census salaries sample a representative group of U.S. households, low-income workers are accurately represented. By contrast, Glassdoor samples only from online employees, in which low-income workers who might be less likely to search for job and company information online may be underrepresented. This underrepresentation is clear in Figure 1, as the distribution of Glassdoor salaries is right-shifted compared to Census incomes, reflecting these missing low-income individuals. Additionally, while Census salaries are top-coded for privacy reasons, Glassdoor data are not, providing potentially richer detail on the gender pay gap among the nation's highest-income earners.

Details of the Sample

We restrict our sample of Glassdoor salaries to full-time workers in five countries—the United States, the United Kingdom, Australia, France and Germany. Most of our analysis is focused on the United States, for which we have the largest sample available.[24] Among Glassdoor salaries, for this study, we use only records for which we have complete demographic information such as age, gender, and highest level of education for workers, as well as job title, employer name, geographic location and year.

Glassdoor's salary survey collects information on base salary as well as total compensation. Base salary is a required field, but users may optionally report income from tips, bonuses, commissions and other forms of pay. Because these fields are optional, they are subject to underreporting by users.[25] For this reason, our primary focus is on *base pay* and we provide figures for total compensation as an illustration only. In general, we suggest caution in interpreting figures for total compensation. All conclusions contained in this report are based on base pay results only.

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[23] For background on the large empirical literature on the lognormal distribution of incomes, see Pinkovskiy (2009). For a discussion of the economic theory behind such "power law" distributions in economics, see Gabaix (2016).

[24] Sample sizes for the five countries are as follows: U.S. = 505,438; U.K. = 22,468; Australia = 4,044; Germany = 1,603; and France = 1,049.

[25] Econometrically, under-reporting of total compensation figures may lead to biased and inconsistent estimates of gender pay gaps if the missingness of these data are not completely at random. As a result, we focus primarily on base pay in our analysis. Figures for total compensation are provided as an illustration only.

Table 1 shows the distribution of salaries for the U.S. sample used in this study. All figures are inflation-adjusted into 2015 dollars using the Consumer Price Index (CPI-U) from the U.S. Bureau of Labor Statistics. The table shows dollar cutoffs for each percentile of earnings for both men and women, including base pay as well as total compensation.

Table 1. Salary Details for U.S. Male and Female Workers

Percentiles	BASE PAY		TOTAL COMPENSATION	
	Men	Women	Men	Women
	Lower Limit	Lower Limit	Lower Limit	Lower Limit
1%	$17,600	$16,560	$18,288	$17,260
5%	$23,400	$20,800	$24,740	$21,660
10%	$28,880	$24,740	$30,960	$25,780
25%	$43,180	$34,223	$47,380	$36,093
50% (Median)	$67,894	$50,015	$73,780	$53,895
75%	$100,025	$75,070	$111,595	$82,499
90%	$132,477	$105,982	$157,934	$121,920
95%	$153,723	$127,549	$198,846	$155,448
99%	$203,200	$175,000	$426,686	$323,000
Mean	$75,913	$59,362	$102,366	$76,692
Observations	324,698	180,740	324,698	180,740
Mean Pay Gap	$16,551		$25,674	
Percent of Mean Male Pay	21.8%		25.1%	
Median Pay Gap	$17,879		$19,885	
Percent of Median Male Pay	26.3%		27.0%	

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In terms of base pay, mean earnings for men in the sample were $75,913 while earnings for females are $59,362. That amounts to an overall average gender pay gap (before controlling for any differences between workers) of $16,551 in base pay, or 21.8 percent of average male salary. That amounts to females earning roughly 78 cents for every dollar earned by males in Glassdoor salary data—broadly similar to figures reported by the U.S. Census Bureau. Note that elsewhere in this study, we *use the difference in log wages* (as explained Section II) as our measure of the gender pay gap, *not this simple average of male and female pay*. This 78-cent figure should only be considered an illustration, provided here in an effort to be as transparent as possible about our data.

The gap between female and male salaries is larger for median pay (26 percent pay gap or females earning 74 cents per dollar earned by males). For total pay, both mean and median gender pay gaps are significantly larger. The mean male-female pay gap for total compensation is 25.1 percent, while the median is 27.0 percent. As noted above, figures for base pay are generally more reliable than for total compensation and these figures should be interpreted cautiously.

A Closer Look at Worker Characteristics

Table 2 shows summary statistics for the data used for our U.S. regressions. It consists of 505,438 salaries for full-time workers between ages 16 and 89 years old (as of the time of the sample in 2015) working in U.S. establishments between 2006 and 2015.[26] The data contain information on 68,475 unique U.S. employers and approximately 31,300 unique job titles. The overall mean base salary is $69,995 per year, ranging from $10,300 to $1.2 million per year. The mean total compensation is significantly higher at $93,185 per year.

In terms of gender balance, roughly 64 percent of the U.S. salaries are male, while 36 percent are female. By comparison, men make up roughly 53 percent of the overall U.S. workforce, with women making up 47 percent.[27] This over-representation of men in the Glassdoor sample largely reflects differences in the likelihood of males versus females searching for job information online, and their willingness to submit salary information to Glassdoor.

For education, 59 percent of the sample held a bachelor's degree, 21 percent held a master's degree, while just 10 percent held only a high school diploma. By comparison, in the overall U.S. population roughly 19 percent hold a bachelor's degree, 10 percent hold any type of graduate degree, and 30 percent hold only a high school diploma.[28] Again, this over-representation reflects different online job searching behavior between college-educated Americans and the general workforce.

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[26] Our sample is based on 505,438 salary reports shared on Glassdoor by U.S.-based, full-time workers as of November 11, 2015. Users can report salaries from up to three calendar years in the past. For our regression estimates, we remove from the sample 2,762 individuals (0.5 percent of the sample) who misreported earnings as less than the 2006 federal minimum wage of $5.15 per hour worked full time for 2,000 hours, or $10,300 per year. Including these individuals does not materially affect any estimates in the study. All amounts reported as hourly wages are expressed in annual terms assuming a 2,000-hour full-time work year. Amounts reported as monthly salaries are expressed as an annual figure assuming a 12-month work year.

[27] See U.S. Bureau of Labor Statistics, "Employment Status of the Civilian Population by Sex and Age," at http://gldr.co/1prKgaq.

[28] See U.S. Census Bureau, "Educational Attainment in the United States: 2014," at http://gldr.co/1LoM9hP.

In terms of age, the average age of workers in the sample was 37 years as of 2015 (those born in 1978). Average years of relevant work experience were 6.7 years. Salaries were earned at employers with an average size of 8,239 workers, ranging from small companies with 25 employees to large employers with 200,000 employees.

Table 2. Summary Statistics for the U.S. Salaries Used in the Regression Analysis

Variable	Observations	Mean	Standard Deviation	Min	Max
Year	505,438	n.a.	n.a.	2006	2015
Base Salary	505,438	$69,995	$40,968	$10,300	$1,237,488
Total Compensation	505,438	$93,185	$271,279	$10,312	$98,100,000
Gender (Male = 1)	505,438	0.64	0.48	0	1
Birth Year	505,438	1978	9.7	1926	1999
Years of Experience	505,438	6.7	6.5	0	60
Associate Degree	505,438	0.04	0.19	0	1
Bachelor's Degree	505,438	0.59	0.49	0	1
High School Diploma	505,438	0.10	0.30	0	1
J.D.	505,438	0.00	0.07	0	1
Master's Degree	505,438	0.21	0.41	0	1
M.B.A.	505,438	0.04	0.20	0	1
M.D.	505,438	0.00	0.03	0	1
Ph.D.	505,438	0.02	0.13	0	1
Firm Size (# Employees)	505,438	8,239	6,589	25	200,000

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Source: Glassdoor Economic Research (Glassdoor.com/research)

IV. Results: The Gender Pay Gap and Its Causes

Below we present our estimates of the gender pay gap in five countries—the United States, the United Kingdom, Australia, Germany and France—based on Glassdoor salary data. We present results for each country separately, each in their own section, ordered from largest to smallest sample size beginning with the United States.

A. UNITED STATES

According to the U.S. Census Bureau, real median earnings for full-time working men were $50,383 in 2014, and $39,621 for women. That amounts to a gender pay gap of $10,762, or 21.4 percent of male earnings.[29] This figure is the basis for the frequently cited statistic that women earn roughly 79 cents for every dollar earned by men. In our sample of Glassdoor salary data, we find a somewhat larger gender pay gap reported by online U.S. employees.

Comparing Similar Workers

In Figure 2, we show estimates for the U.S. gender pay gap among online employees. The figure shows the percentage gap between male and female wages, before and after statistical controls have been applied.[30] Column 1 shows the raw gender pay gap with no statistical controls. We refer to this as the "unadjusted" gender pay gap. Moving to the right, columns 2 through 5 show how the pay gap changes as additional statistical controls are added in an attempt to provide an apples-to-apples comparison of male and female workers.

For base pay, the raw, unadjusted male-female pay gap is 24.1 percent in column 1. This means that on average, men in our sample of Glassdoor salary data report earning about 24.1 percent higher base pay than women. For total compensation, the unadjusted pay gap appears somewhat larger at 27.0 percent.

Controlling for age, education and years of experience, we see that the gender pay gap shrinks to 19.2 percent for base pay, and 22.2 percent for total compensation in column 2. Economists refer to these types of personal worker characteristics as "human capital," as they are indicators of differences in productivity of workers. This illustrates that accounting for differences in education and experience eliminates some of the pay gap, but only a small fraction—about 5 percentage points of the overall 24.1 percent gap.

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[29] See DeNavas-Walt and Bernadette Proctor (2015).
[30] Full tables of regression results and standard errors are available in the Appendix at http://gldr.co/1MjfNjt.

Figure 2. Overall U.S. Results: Estimates of the "Unadjusted" and "Adjusted" Gender Pay Gap for Comparable Workers

U.S. Gender Pay Gap, Before and After Adding Statistical Controls
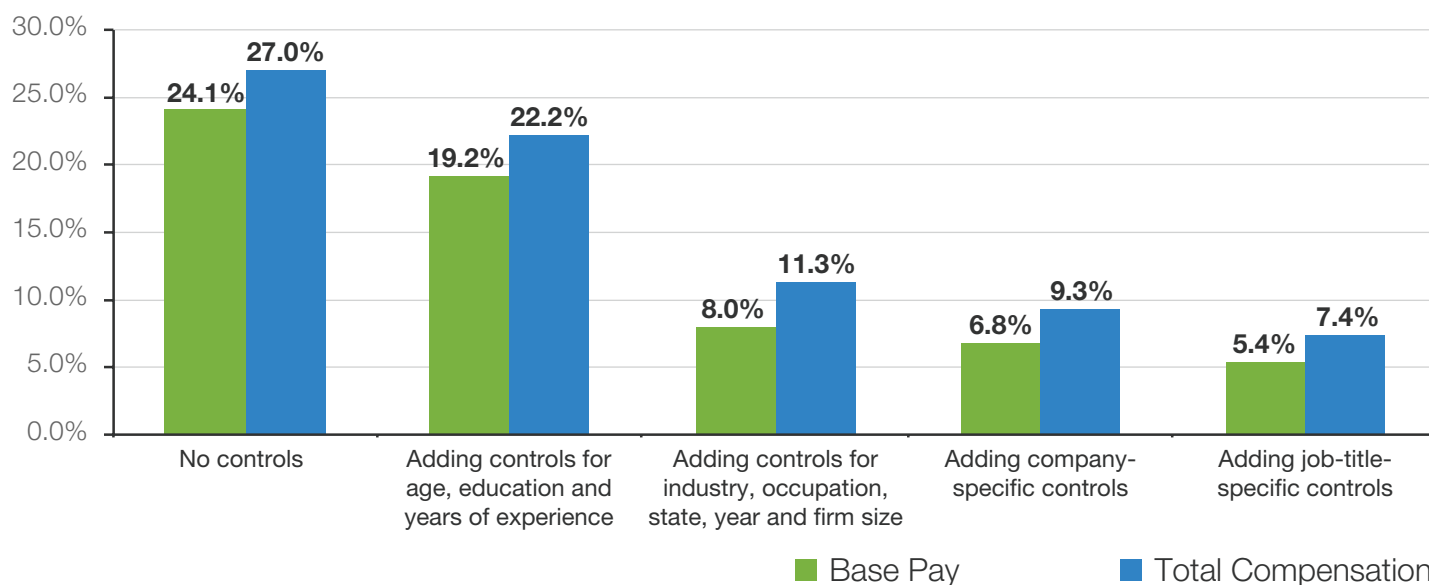
Source: Glassdoor Economic Research (Glassdoor.com/research)

In column 3, we add controls for industry, occupation, state, year, and company size.[31] These controls help account for the well-known problem that men and women tend to sort into different jobs and industries; for example, human resources workers in the U.S. are 73 percent female, while computer programmers are 81 percent male.[32] To the extent that men and women select into—or are excluded from—certain jobs and industries, this has a dramatic effect on gender pay differences. Adding these controls dramatically reduces the gender pay gap to 8.0 percent for base pay and 11.3 percent for total compensation, eliminating roughly half of the male-female pay difference.

Finally, in columns 4 and 5 we show the gender pay gap after all statistical controls are applied. While Census Bureau data only classify workers into broad occupations and industries, with Glassdoor salary data we are able to add powerful statistical controls at the level of job title and employer name. This allows us to control for sorting of men and women into different jobs and companies, even within the same industry or occupation.[33]

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[31] For industries, we use 25 economic sectors listed on Glassdoor. For occupations, we use Glassdoor's proprietary grouping of job titles into 157 broad occupational categories.

[32] See U.S. Bureau of Labor Statistics, "Median Weekly Earnings of Full-Time Wage and Salary Workers by Detailed Occupation and Sex," at http://gldr.co/21r9Jy7.

[33] For job title controls, we use Glassdoor's proprietary grouping of raw job titles into roughly 2,000 occupational categories. Raw job titles cannot be used directly in regression analyses, due to severe over-fitting problems from the need to estimate tens of thousands of job-title-specific fixed effects, many of which are identified off one or a small handful of observations. We instead use roughly 2,000 occupation-level fixed effects to reduce the dimensionality of the estimation problem.

Adding employer-level controls in column 4, the gender pay gap falls to 6.8 percent for base pay and 9.3 percent for total compensation. Adding job-title level controls in column 5, the gender pay gap shrinks to 5.4 percent for base pay, and 7.4 percent for total compensation. Both estimates remain highly statistically significant. These represent our best estimates of the "adjusted" gender pay gap in the U.S. for online employees, once we've controlled for all observed differences between men and women.

On the one hand, it may appear that the gender pay gap is much smaller than commonly assumed. After all, adding various statistical controls shows that the raw gender pay gap falls from 24.1 percent to 5.4 percent once we carefully compare men and women with similar backgrounds, jobs, and at similar companies.

How should we interpret these results? Although it is true that the "adjusted" gender pay gap is significantly smaller than the overall gap commonly cited in debates over gender pay, it is a real gap that is worrisome for at least two reasons.

First, not all of the statistical controls we've applied represent purely voluntary choices by workers. Education is influenced by socioeconomic background, work experience is determined partly by balancing career and family, and the choice of job title and industry is heavily influenced by social and gender norms that discourage men and women from choosing freely between professions. Just because we can statistically control for differences between workers does not mean those differences are due to free choices by workers.

Second, although controlling for worker and job characteristics dramatically reduces the gender pay gap, *it is remarkable that a statistically significant 5.4 percent difference remains*—even after controlling for the same job title, at the same employer, in the same state, for workers with comparable education, age, and experience. These findings provide strong evidence that there remains a persistent U.S. gender pay gap, a conclusion supported by a large number of academic studies as well.

What Causes the Gap? Oaxaca-Blinder Decomposition

Figure 3 shows which factors help best explain the gap between male and female pay. For both base pay and total compensation, it shows the classic Oaxaca-Blinder decomposition of the overall pay gap into the part that is "explained" by differences between male and female workers, and the part that is "unexplained" due to differences in the way labor markets treat men and women with similar characteristics, or due to unobserved worker characteristics.

U.S. Explained and Unexplained Gender Pay Gap
(Oaxaca-Blinder Decomposition)
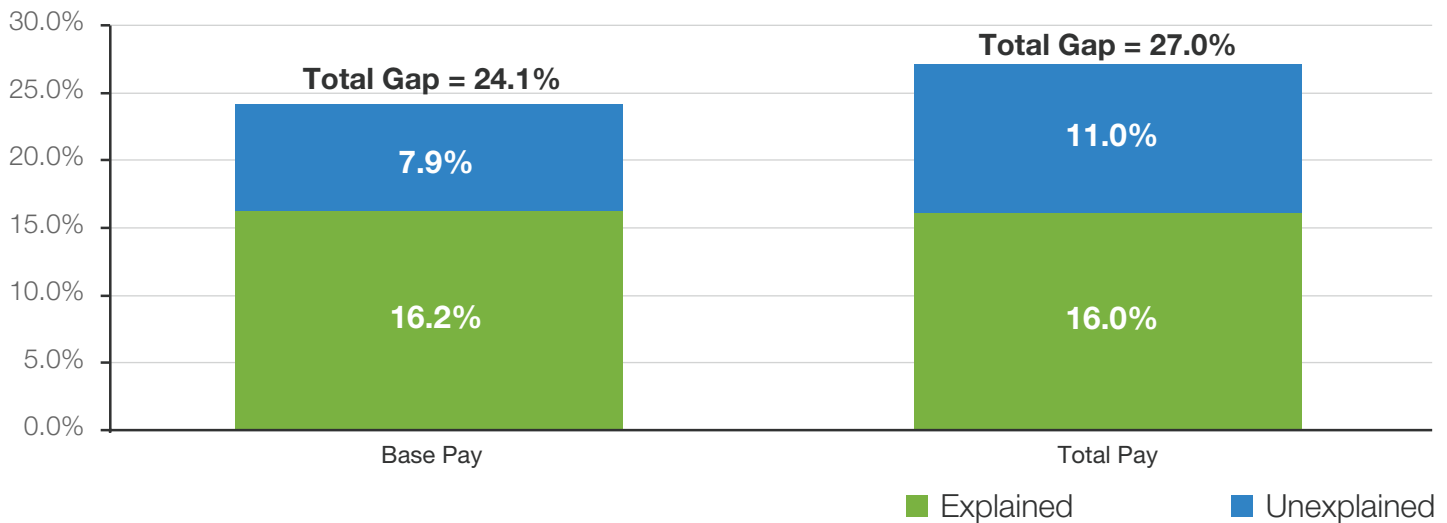
Source: Glassdoor Economic Research (Glassdoor.com/research)

Of the overall U.S. gender pay gap of 24.1 percent in base pay, we find that 16.2 percent is "explained" by differences between male and female workers: different ages, levels of education, experience, industries, occupations, company sizes and locations. The remaining 7.9 percent of the pay gap is "unexplained," due either to factors we aren't able to observe or to workplace bias and discrimination.

This finding means that about 67 percent (16.2/24.1 = 67 percent) of the overall U.S. gender pay gap in base pay is explained by worker characteristics. The remaining 33 percent is unexplained, and due to differences in the way the labor market rewards men and women with the same characteristics, or due to unobserved worker characteristics. The results for total compensation are similar: 16.0 percent is "explained" while the remaining 11.0 percent is "unexplained."

Table 3 provides additional detail on this decomposition. For both base pay and total compensation, it shows how much of the gender pay gap is explained by two factors: (1) differences between the education and experience of workers, or what economists call "human capital"; and (2) sorting of men and women into different occupations and industries in the economy.

Only 14 percent of the gender gap in base pay is explained by differences in education and experience between men and women. By contrast, occupation and industry sorting of men and women into different jobs and industries explains 54 percent of the gap, the largest factor by far. This is an important finding for policy solutions attempting to address the gender pay gap. Most of today's differences in male-female pay are due to forces that push men and women into different jobs and industries—including different paths through the education system, pressures that divert men and women into different college majors and career tracks, and social norms regarding child care and family responsibilities. By comparison, little of the gap is explained by differences in experience and levels of education, or is left unexplained and possibly due to overt discrimination.

Table 3. Details of the Oaxaca-Blinder Decomposition: Occupation and Industry Sorting Explains Most of the Gender Pay Gap, Not Education and Experience.

	Log Base Pay	Log Total Compensation
Mean Male Pay	11.080	11.205
Mean Female Pay	10.839	10.935
Unadjusted Gender Pay Gap	-0.241	-0.270
Explained Pay Gap (Due to Differences in Worker Characteristics)	-0.162	-0.160
Percentage Explained	67%	59%
Education & Experience ("Human Capital")	14%	13%
Choice of Occupation and Industry	54%	47%
Unexplained Pay Gap (Due to Differences in Regression Coefficients)	-0.079	-0.110
Percentage Unexplained	33%	41%
Observations	505,438	505,438
Controls Included:		
Worker Demographics	X	X
State	X	X
Year	X	X
Industry	X	X
Occupation	X	X
Company Size	X	X

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Source: Glassdoor Economic Research (Glassdoor.com/research)

Next we show differences in the U.S. gender pay gap among industries. To do this, we re-estimate the above regression model from equation (1) while including interaction terms for *male x industry*.[34] The coefficients on these interaction terms tell us whether being male and working in a particular industry results in a statistically larger or smaller pay gap. To calculate each industry's gender pay gap, we sum together the coefficient on *male* in the model and the coefficient on each industry's *male x industry* interaction term.[35]

Figure 4 shows the "adjusted" gender pay gap for the 25 U.S. industries examined in this study. Two industries are tied for the largest gender pay gap in Glassdoor salary data: health care and insurance, both at 7.2 percent. This amounts to women earning on average 93 cents per dollar earned by men working in the same job title, same company, and with similar background and experience. This gap is roughly 33 percent larger than the U.S. average "adjusted" gender pay gap of 5.4 percent.

The second largest gender pay gaps are found in mining & metals (6.8 percent), followed by transportation & logistics (6.7 percent), media (6.6 percent)— an industry that includes book publishers, television networks, video game producers, newspapers, as well as many online media providers—and arts, entertainment & recreation (6.6 percent).

The smallest "adjusted" gender pay gaps in Glassdoor salary data are found in two U.S. industries: aerospace & defense—an industry that includes airline manufacturers, security and logistics companies, and a wide variety of federal defense contractors—and agriculture & forestry, both at 2.5 percent. This amounts to women earning on average 97.5 cents per dollar earned by men in the same job title, same company, and with similar background and experience. This gap is roughly 54 percent smaller than the average U.S. "adjusted" gender pay gap of 5.4 percent. The second smallest gender pay gaps are found in biotech & pharmaceuticals (3.0 percent), followed by travel & tourism (3.0 percent), restaurant, bars & food services (3.2 percent) and education (3.3 percent).
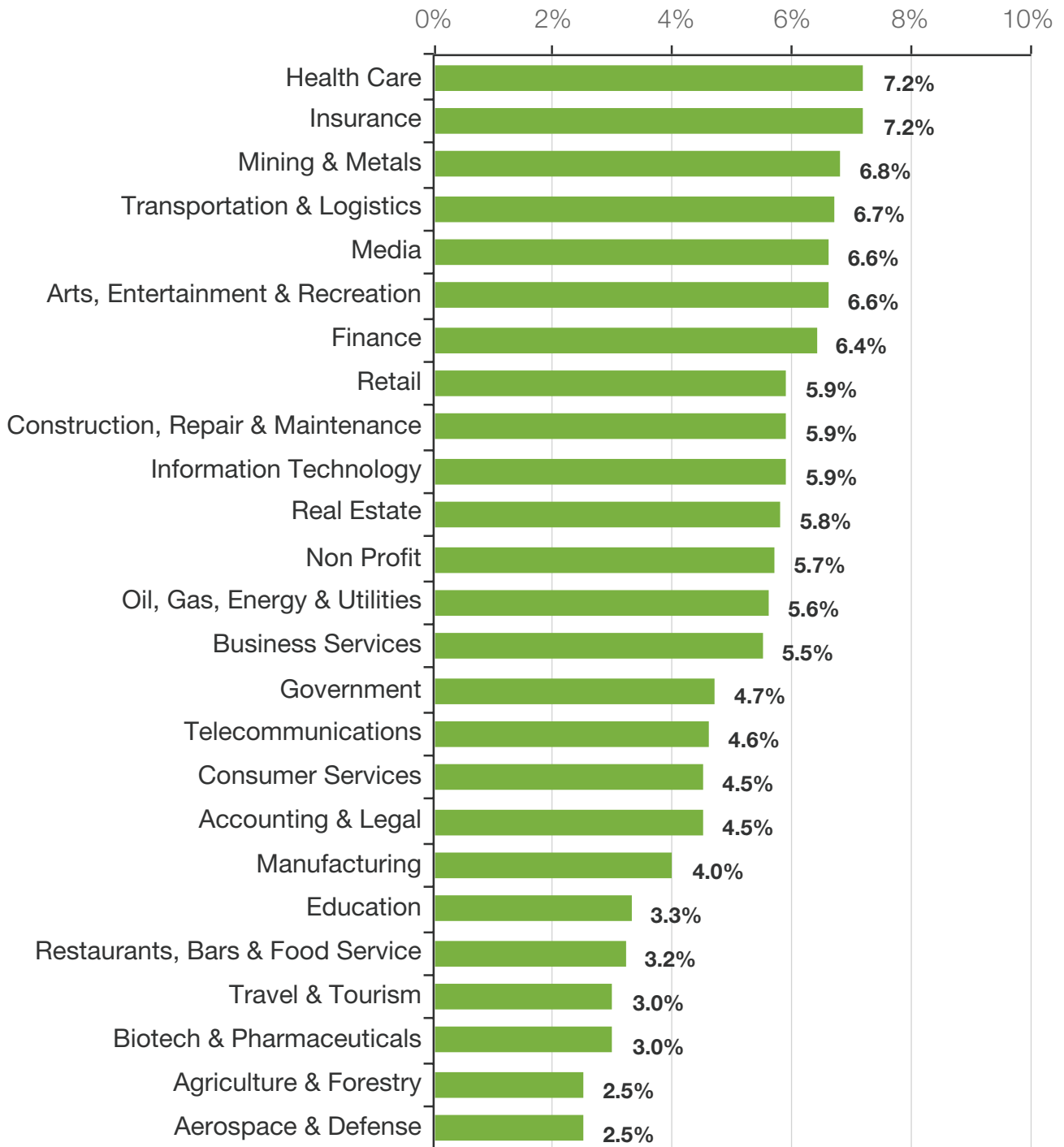
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34 This approach is a conventional econometric method for assessing group differences; see for example, Richard Williams, "Interaction Effects and Group Comparisons," available at http://gldr.co/1LG91nD.

35 Mathematically, the industry gender pay gaps in Figure 4 represent $\beta_{industry} = \beta_{male} + \beta_{(male\ x\ industry)}$. The excluded "reference" category is the Accounting & Legal industry. The statistical model for industry and occupation estimates corresponds to the model in column 5 of Figure 1, which includes controls for age, education, experience, state, year, job title, and company name. Complete results are provided in the Appendix at http://gldr.co/1MjfNjt.

Figure 4. "Adjusted" Gender Pay Gaps Vary Widely by U.S. Industry

"Adjusted" Gender Pay Gap by U.S. Industry
(Percentage Higher Average Male Pay)

Industry	Pay Gap
Health Care	7.2%
Insurance	7.2%
Mining & Metals	6.8%
Transportation & Logistics	6.7%
Media	6.6%
Arts, Entertainment & Recreation	6.6%
Finance	6.4%
Retail	5.9%
Construction, Repair & Maintenance	5.9%
Information Technology	5.9%
Real Estate	5.8%
Non Profit	5.7%
Oil, Gas, Energy & Utilities	5.6%
Business Services	5.5%
Government	4.7%
Telecommunications	4.6%
Consumer Services	4.5%
Accounting & Legal	4.5%
Manufacturing	4.0%
Education	3.3%
Restaurants, Bars & Food Service	3.2%
Travel & Tourism	3.0%
Biotech & Pharmaceuticals	3.0%
Agriculture & Forestry	2.5%
Aerospace & Defense	2.5%

Source: Glassdoor Economic Research (Glassdoor.com/research)
Notes: Corresponds to the model in column 5 of Figure 2, which includes our most detailed
possible controls for age, education, experience, state, year, job title, and employer name.

Differences by Occupation

Using a similar method, we estimate differences in the gender pay gap by U.S. occupational groups in Glassdoor salary data. This is done by including *male x occupation* interaction terms in our basic model, and combining them with the overall *male* coefficient in the model.[36] This reveals whether male workers receive a significant additional pay bonus (or discount) from being male and working in a specific occupation.

Figure 5 shows the 15 occupations with the highest "adjusted" gender pay gaps, after statistically controlling for differences between jobs and workers. The occupation with the highest gender pay gap was computer programmer, with a gap of 28.3 percent. This amounts to women earning on average 72 cents per dollar earned by men, after controlling for all differences between jobs, companies and workers—a gap that is roughly five times larger than the U.S. average "adjusted" gender pay gap of 5.4 percent.

Two occupations were tied for the second highest gender pay gap: chef and dentist, both with a gap of 28.1 percent. They are followed by C-suite occupations (27.7 percent), a finding that is broadly consistent with academic research showing a persistent gender pay gap among executive-level positions in the U.S. Other occupations with larger-than average gender pay gaps include psychologist (27.2 percent), pharmacist (21.8 percent), CAD ("computer aided design") designer (21.5 percent), physician (18.2 percent), optician (17.3 percent), pilot (16.0 percent), and game artist (15.8 percent)—an occupation related to the design and development of video games.

Figure 6 shows the U.S. occupations with the smallest "adjusted" gender pay gaps. For many of these occupations, there is a significant female pay advantage, or a "reverse" gender pay gap. The occupation with the smallest gap is social worker at minus 7.8 percent. This amounts to women earning on average 108 cents per dollar earned by men working in the same job title, same company, and with similar background and experience.
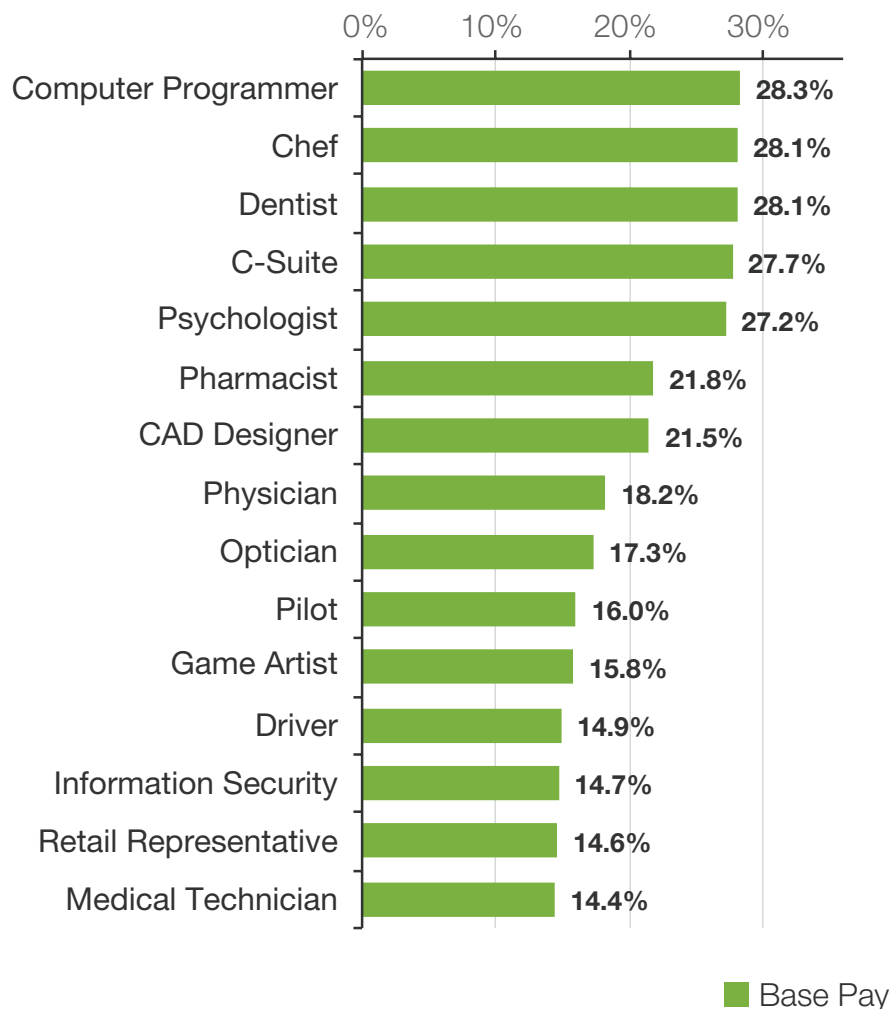
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36   For occupational groups, we group together similar job titles using Glassdoor's proprietary algorithm, which uses job title normalization and job seeker behavior to cluster similar job titles into 157 major occupational categories. Of the 157 occupations examined, we report results only for those with at least 30 salary reports. In our regression analysis, one occupational category serves as the excluded category ("Beauty"), while two are omitted due to sample sizes less than N = 30. This results in a set of 154 occupational groups. Full regression results are reported in the Appendix at http://gldr.co/1MjfNjt.

The occupation with the second smallest "adjusted" gender pay gap is merchandiser (minus 7.6 percent). They are followed by research assistant (minus 6.6 percent)—an occupation comprised of many graduate student workers at various U.S. universities—purchasing specialist (minus 5.5 percent), physician advisor (minus 2.4 percent), communications associate (minus 2.2 percent), social media (minus 1.9 percent), health educator (minus 0.9 percent), procurement (minus 0.8 percent) and business coordinator (minus 0.5 percent).

Figure 5. U.S. Occupations with the Highest "Adjusted" Gender Pay Gaps

Top 15 U.S. Occupations by "Adjusted" Gender Pay Gap
(Percentage Higher Average Male Pay)

Occupation	Adjusted Gender Pay Gap
Computer Programmer	28.3%
Chef	28.1%
Dentist	28.1%
C-Suite	27.7%
Psychologist	27.2%
Pharmacist	21.8%
CAD Designer	21.5%
Physician	18.2%
Optician	17.3%
Pilot	16.0%
Game Artist	15.8%
Driver	14.9%
Information Security	14.7%
Retail Representative	14.6%
Medical Technician	14.4%

■ Base Pay

Source: Glassdoor Economic Research (Glassdoor.com/research)
Notes: Corresponds to the model in column 5 of Figure 2, which includes our most detailed possible controls for age, education, experience, state, year, job title, and employer name.
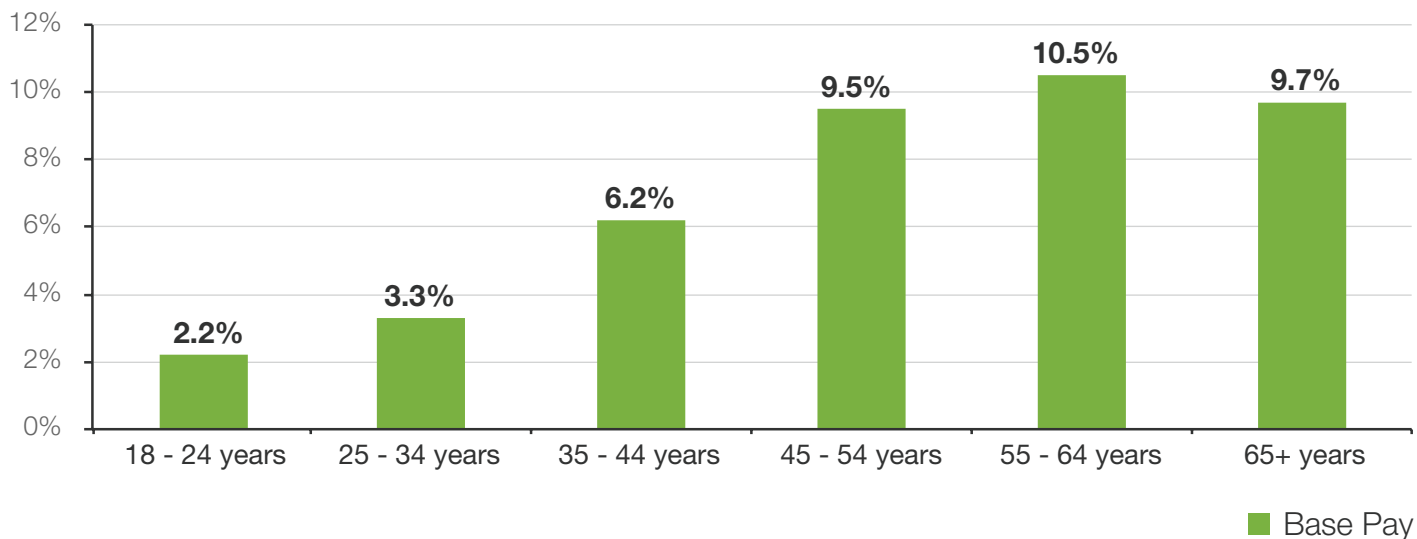
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Bottom 15 U.S. Occupations by "Adjusted Gender Pay Gap (Percentage Higher Average Male Pay)
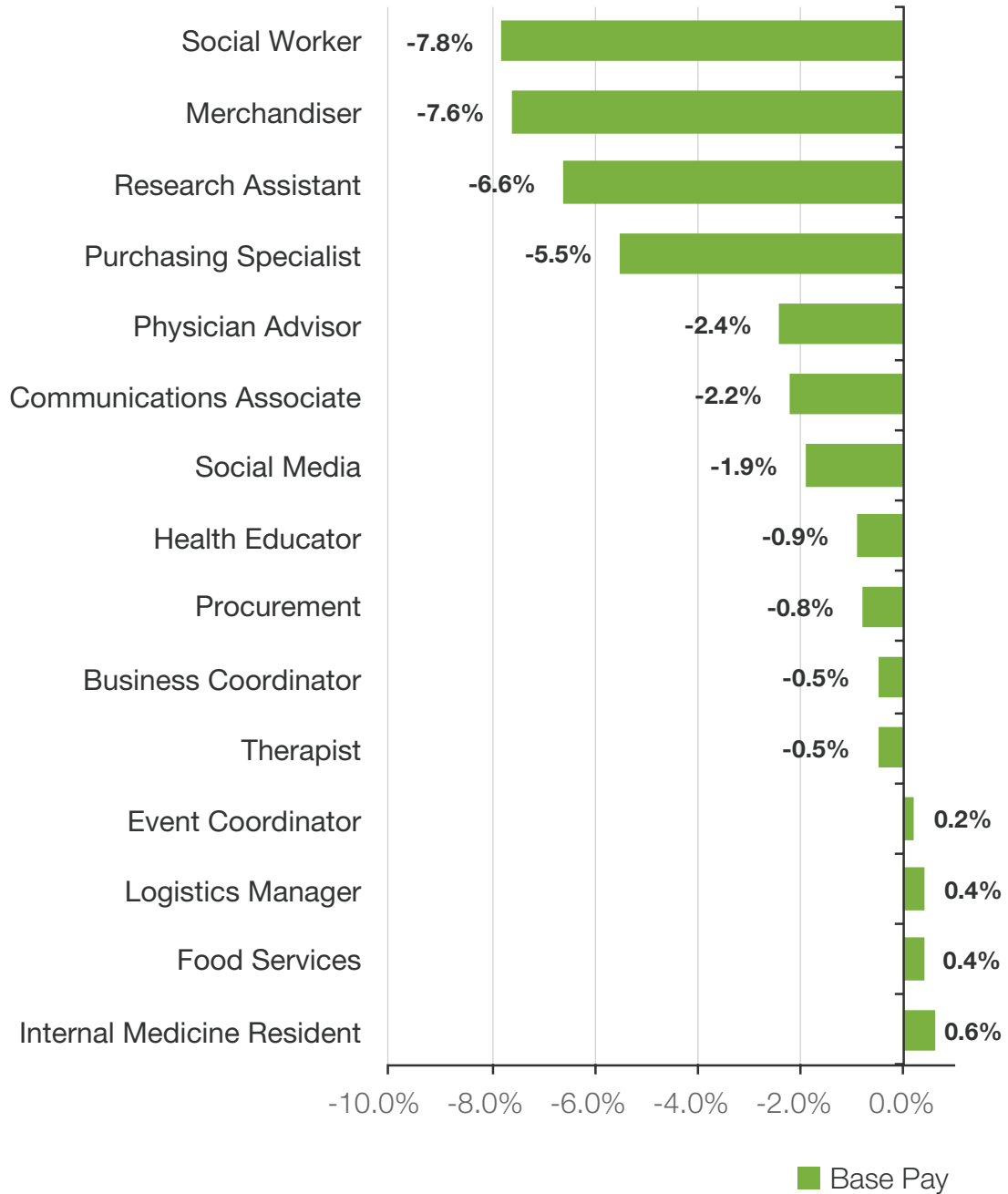
Occupation	Value
Social Worker	-7.8%
Merchandiser	-7.6%
Research Assistant	-6.6%
Purchasing Specialist	-5.5%
Physician Advisor	-2.4%
Communications Associate	-2.2%
Social Media	-1.9%
Health Educator	-0.9%
Procurement	-0.8%
Business Coordinator	-0.5%
Therapist	-0.5%
Event Coordinator	0.2%
Logistics Manager	0.4%
Food Services	0.4%
Internal Medicine Resident	0.6%

-10.0% -8.0% -6.0% -4.0% -2.0% 0.0%

■ Base Pay

Source: Glassdoor Economic Research (Glassdoor.com/research)
*Notes: Corresponds to the model in column 5 of Figure 2, which includes our most detailed
possible controls for age, education, experience, state, year, job title, and employer name.*

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Differences by Age

A well-known finding in the labor economics literature is that gender pay differences tend to grow with age. That is, older workers typically show significantly larger gender pay gaps than younger workers—both in the U.S. and around the world. We find a similar pattern in Glassdoor salary data, with the "adjusted" gender pay gap growing steadily with age. As above, this is done by including *male x age group* interaction terms in our basic model and adding these interaction coefficients to the overall *male* coefficient in the model.[37]

Figure 7 shows the gender pay gap by age groups, after statistically controlling for differences between workers, jobs and employers. The gender pay gap is smallest among young and early-career workers, growing steadily with age into mid- and late career. Workers aged 18 to 24 years experience a relatively small 2.2 percent "adjusted" gender pay gap, well below the U.S. average of 5.4 percent. Similarly, workers aged 25 to 34 years exhibit a 3.3 percent pay gap. By contrast, workers aged 45 to 54 years face a 9.5 percent gender pay gap, while those aged 55-64 years face a 10.5 percent pay gap—nearly twice the U.S. average.

Figure 7. The U.S. Gender Pay Gap Grows Steadily with Working Age

"Adjusted" U.S. Gender Pay Gap by Age Groups
(Percentage Higher Average Male Pay)

Source: Glassdoor Economic Research (Glassdoor.com/research)
Notes: Corresponds to the model in column 5 of Figure 2, which includes our most detailed possible controls for age, education, experience, state, year, job title, and employer name.

[37] The excluded or "reference" category is workers aged 35 to 44 years.

There are several competing explanations for this finding. For one, the gender pay gap may be smaller among young workers because women beginning their careers today face fewer barriers than older workers faced in previous generations. Alternatively, older women may simply face harsher age discrimination in the labor market, amplifying the gender pay gap for older workers. At least some academic research appears to support this latter interpretation.[38] Finally, this result may be due to factors we don't observe in our data, such as whether older women have spent more time out of the labor force due to child-bearing responsibilities, and simply face an earnings penalty compared to men who have not left the labor force during their careers.

Differences Over Time

Studies show there has been a dramatic narrowing of the gender pay gap in the U.S. since the late 1950s.[39] From 1960 through roughly 1980, the ratio of average female to male pay for full-time workers hovered between 55 and 60 percent. Beginning in 1980 that ratio began rising, reaching 70 percent by 1990 and 77 percent by 2005. Since then, the U.S. gender pay ratio has hovered around today's level of 77 to 79 percent.

Figure 8. The U.S. Gender Pay Gap Has Remained Steady Since 2007

"Adjusted" U.S. Gender Pay Gap Unchanged Over Time
(Percentage Higher Average Male Pay)
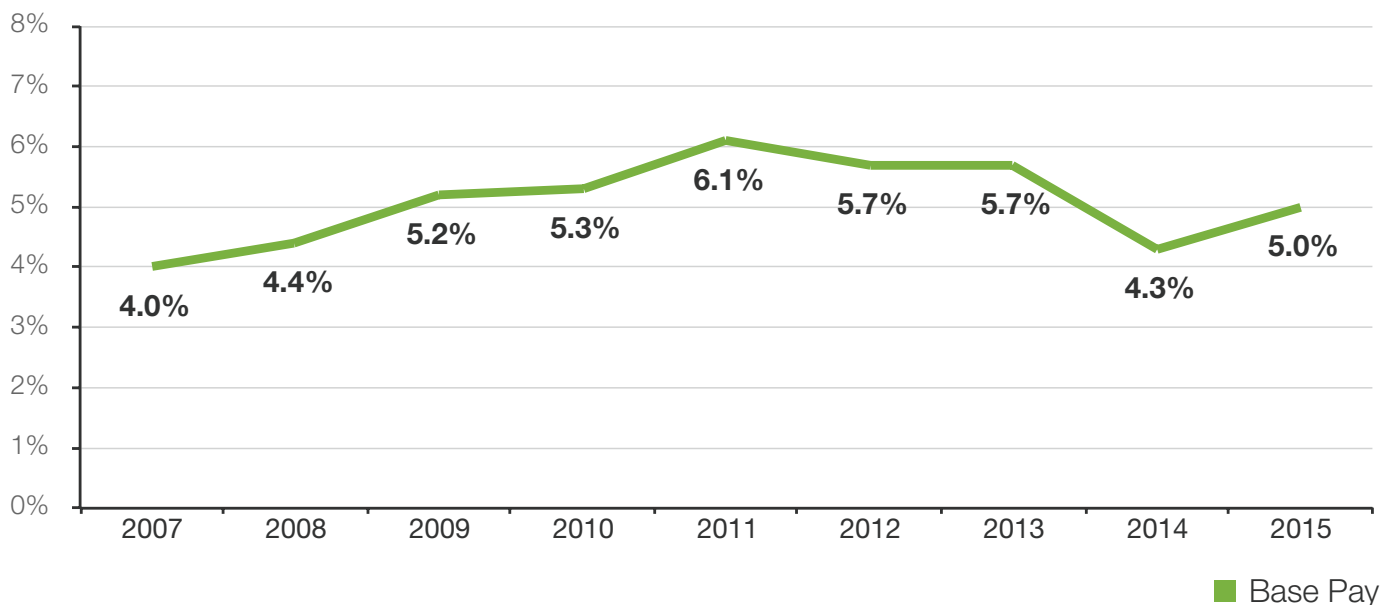
Source: Glassdoor Economic Research (Glassdoor.com/research)
Notes: Corresponds to the model in column 5 of Figure 2, which includes our most detailed possible controls for age, education, experience, state, year, job title, and employer name.

[38] See for example Farber, Silverman and von Wachter (2015), whose findings are summarized at http://gldr.co/1QEwVao.
[39] For a complete time series of changes in the U.S. gender pay gap over time, See Blau and Kahn (2016).

Because Glassdoor is a relatively new online platform, it does not feature the type of long time series needed to estimate long-term trends in the gender pay gap. Our sample spans a relatively short period from 2006 to 2015, and during this time we find no evidence of a significant shift in the U.S. gender pay gap.

Figure 8 shows the percentage "adjusted" gender pay gap for each year between 2007 and 2015. As above, these estimates are derived by including *male x year* interaction terms in our basic model and adding these interaction coefficients to the overall *male* coefficient in the model.[40] We find the "adjusted" gender pay gap has been essentially flat during this period, ranging from 4.0 percent to 6.1 percent after controlling for differences between workers, jobs and employers. Although there has been tremendous progress toward gender pay equity in the U.S. in recent decades, it is still too soon to see these effects in Glassdoor's crowd-sourced data from online employees.

B. UNITED KINGDOM

The Office of National Statistics estimates that the U.K. gender pay gap is roughly 19.2 percent in 2015.[41] In our sample of Glassdoor salary data, we find a somewhat larger gender pay gap reported by online U.K. employees. For our analysis, we use a sample of 22,468 Glassdoor salaries reported by U.K. employees. As in our U.S. sample we restrict our analysis to workers over age 16 working full time for whom we have basic demographic information such as age, education and years of experience.

In our Glassdoor U.K. salary sample, the average base pay was £47,672 per year for men and £38,125 for women. That amounts to a gender pay gap of £9,547 in base pay between men and women, or roughly 20.0 percent of average male pay. That amounts to U.K. women earning roughly 80p for every pound earned by men on average. As in the U.S., in terms of median pay the U.K. gender gap is slightly larger at 22.8 percent. But unlike the U.S., the unadjusted gender pay gap for total compensation in the U.K. is nearly identical to base pay: 18.6 percent for mean total compensation and 22.6 percent for median total pay.[42]

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[40] The excluded or "reference" category is calendar year 2006.
[41] Source: U.K. Office of National Statistics, at http://gldr.co/21gsCqN.
[42] As with U.S. salary data, we focus on base pay in our analysis, and provide figures for total compensation as an illustration only. We suggest caution in interpreting total compensation figures due to potentially large underreporting bias.

Table 4 provides a summary of the U.K. sample used in our regression analysis. The sample contains 22,468 salaries reported from calendar years 2006 through 2015.[43] The data contain information on approximately 5,400 unique U.K. employers and 4,300 job titles. The average base pay in the sample was £45,385, ranging from £6,934 to a high of £364,487.[44] Average total compensation was significantly higher at £61,162. The sample is 76 percent male and 24 percent female, and the average age (as of 2015) was 34 years with 5.8 years of relevant work experience. Fifty-six percent of the sample had bachelor's degrees, 29 percent had master's degrees, and 8 percent had only a high school diploma. The average employer size was 8,784 employees, ranging from small 25-person firms to employers with 200,000 employees.

Table 4. Summary Statistics for the U.K. Salary Sample

| Variable	Observations	Mean	Standard Deviation	Min	Max
Year	22,468	n.a.	n.a.	2006	2015
Base Salary	22,468	£45,385	£26,949	£6,934	£364,487
Total Compensation	22,468	£61,162	£143,346	£6,934	£8,891,400
Gender (Male = 1)	22,468	0.76	0.43	0	1
Birth Year	22,468	1981	8.1	1927	1999
Years of Experience	22,468	5.8	5.7	0	60
Associate Degree	22,468	0.01	0.10	0	1
Bachelor's Degree	22,468	0.56	0.50	0	1
High School Diploma	22,468	0.08	0.27	0	1
J.D.	22,468	0.00	0.03	0	1
Master's Degree	22,468	0.29	0.46	0	1
M.B.A.	22,468	0.03	0.18	0	1
M.D.	22,468	0.00	0.04	0	1
Ph.D.	22,468	0.02	0.15	0	1
Firm Size (# Employees)	22,468	8,784	9,001	25	200,000

[43] The sample was pulled from Glassdoor's salary database on November 24, 2015. Only full-time workers are included in the sample.

[44] For our regression estimates, we remove from the sample 14 individuals (0.06 percent of the sample) who misreported earnings as less than the 2006 U.K. minimum wage of £3.30 per hour worked full time for 2,000 hours, or £6,600 per year (Source http://gldr.co/1TG55eh). Including these individuals does not materially affect any estimates in the study. All salaries reported as hourly wages are expressed in annual terms assuming a 2,000-hour full-time work year.

Comparing Similar Workers

Figure 9 presents our estimates of the "unadjusted" and "adjusted" gender pay gap in U.K. salaries from Glassdoor. Column 1 shows the "unadjusted" pay gap with no statistical controls for differences between workers or jobs. Overall, there is a 22.9 percent "unadjusted" gap in base pay between males and females, and a 25.1 percent gender pay gap in total compensation. Applying controls for age, education and years of experience, the gender pay gap in column 2 shrinks to 15.0 percent for base pay and 17.2 percent for total compensation. Finally adding in a rich set of controls for company and job title, in column 5 we find an "adjusted" gender pay gap of 5.5 percent for base pay, and 8.4 percent for total compensation.

Figure 9. Overall U.K. Results: Estimates of the "Unadjusted" and "Adjusted" Gender Pay Gap for Comparable Workers
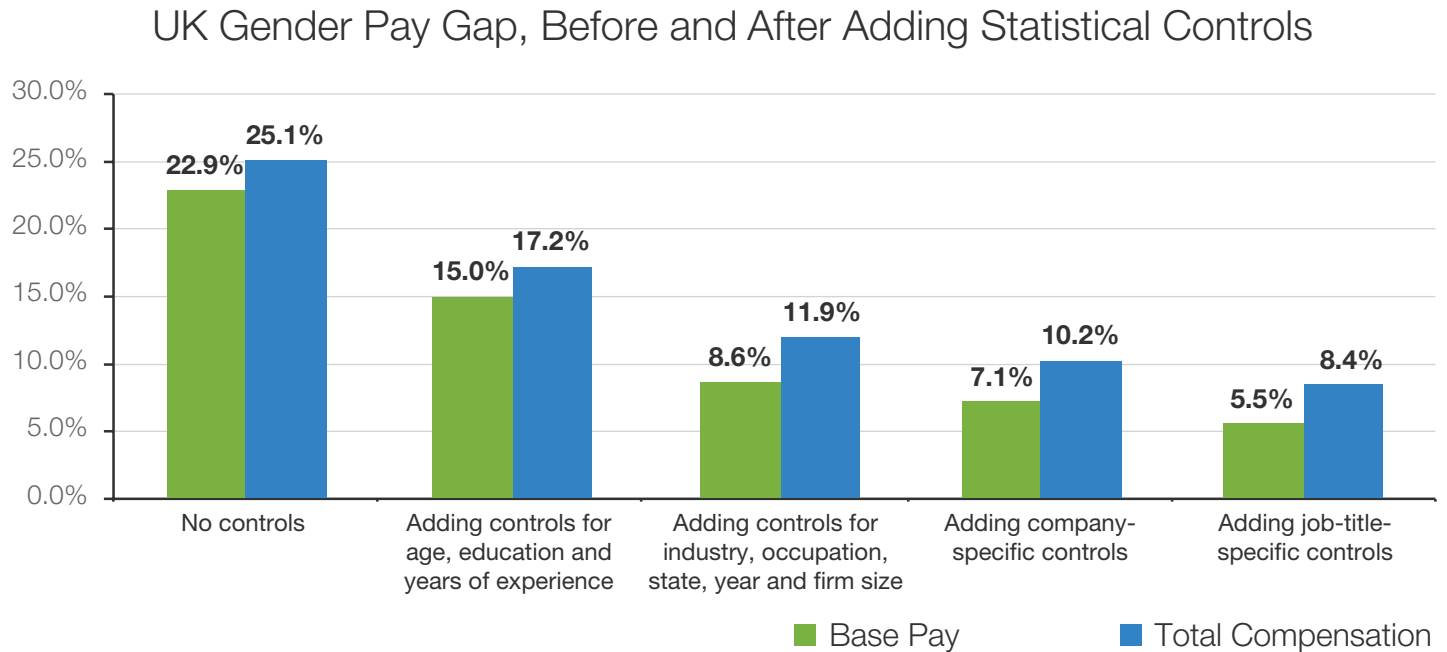
UK Gender Pay Gap, Before and After Adding Statistical Controls

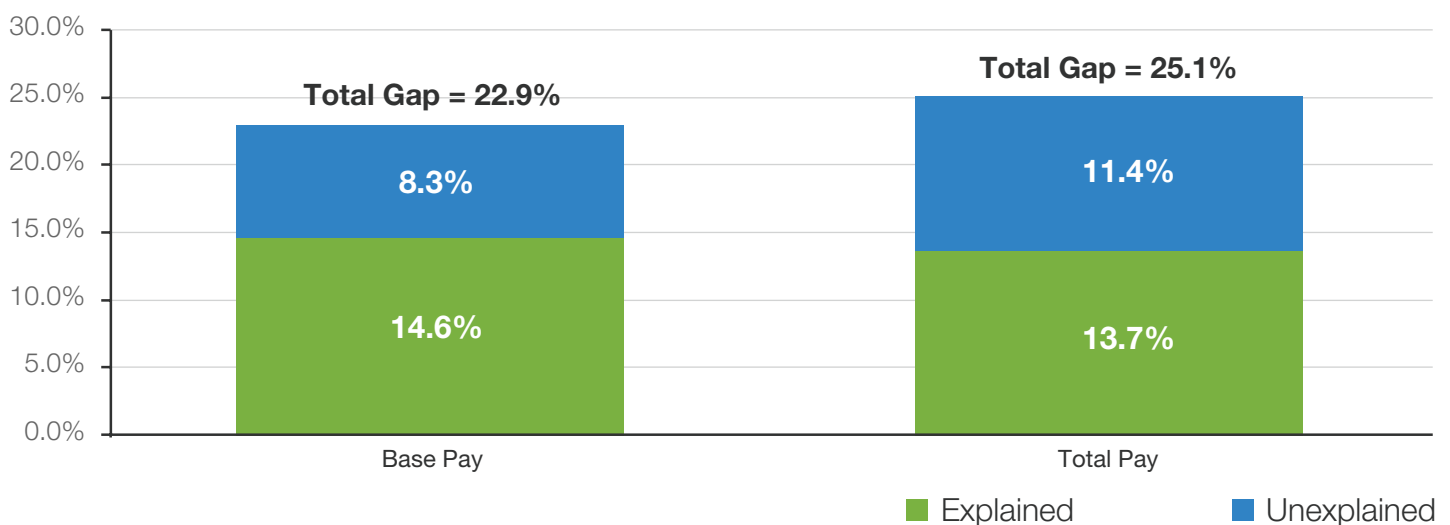Source: Glassdoor Economic Research (Glassdoor.com/research)

Figure 10 shows the decomposition of the U.K. gender pay gap in Glassdoor salary data into the portion that is "explained" by differences in worker characteristics, and the portion that remains "unexplained" due either to unobserved factors or subtle forms of workplace bias and discrimination.

Of the overall 22.9 percent gender gap in base pay, 14.6 percent (or just under two-thirds) is explained by differences in worker characteristics, while the remaining 8.3 percent (roughly one-third) is unexplained. This finding means that about 64 percent (14.6/22.9 = 64 percent) of the overall U.K. gender pay gap in base pay is explained by worker characteristics. The remaining 36 percent is unexplained and due to differences in the way the labor market rewards men and women with the same characteristics.

In the Appendix, we provide full details of the Oaxaca-Blinder decomposition for the U.K. In those tables, we see that of the roughly two-thirds of the gender gap that is explained, 38 percent is due to sorting of men and women into different industries and occupations, while just 26 percent is due to differences in education and experience between males and females. Put differently, individual worker characteristics explain only about one-quarter of the U.K. gender pay gap. By contrast, the fact that men and women systematically work in different roles explains almost 40 percent.

Figure 10. Decomposing the U.K. Gender Pay Gap into "Explained" and "Unexplained" Portions

UK Explained and Unexplained Gender Pay Gap
(Oaxaca-Blinder Decomposition)

Source: Glassdoor Economic Research (Glassdoor.com/research)
Notes: Includes controls for age, education, experience, industry, occupation, year, state and company size.

The Australian Workplace Gender Equality Agency estimates that the Australian gender pay gap is roughly 17.9 percent in 2015.[45] In our sample of Glassdoor salary data, we find a somewhat smaller gender pay gap reported by online Australian employees. For our analysis, we use a sample of 4,044 Glassdoor salaries reported by Australian employees. As in our U.S. sample, we restrict our analysis to workers over age 16 working full time for whom we have basic demographic information such as age, education and years of experience.

In our Glassdoor Australia salary sample, the average base pay was AUD$99,940 per year for men and AUD$84,218 for women. That amounts to a gender pay gap of AUD$15,722 in base pay between men and women, or roughly 15.7 percent of average male pay. That amounts to Australian women earning roughly 84 cents for every dollar earned by men on average. As in the U.S., in terms of median pay the Australian gender gap is slightly larger at 16.8 percent. The unadjusted gender pay gap for total compensation is slightly higher than for base pay: 17.0 percent for mean total compensation and 17.5 percent for median total pay.[46]

Table 5 provides a summary of the Australia sample used in our regression analysis. It contains 4,044 salaries reported from calendar years 2006 through 2015.[47] The data contain information on approximately 1,370 unique Australia employers and 1,050 job titles. The average base pay in the sample was AUD$96,282, ranging from AUD$25,625 to a high of AUD$453,863.[48] Average total compensation was somewhat higher at AUD$111,072. The sample is 77 percent male and 23 percent female, and the average age (as of 2015) was 35 years with 6.3 years of relevant work experience. 59 percent of the sample had bachelor's degrees, 27 percent had master's degrees, and 8 percent had only a high school diploma. The average employer size was 9,236 employees, ranging from small 25-person firms to employers with 15,000 employees.

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45   Source: Australia Workplace Gender Equality Agency, at http://gldr.co/1QExuBd.

46   As with U.S. salary data, we focus on base pay in our analysis, and provide figures for total compensation as an illustration only. We suggest caution in interpreting total compensation figures due to potentially large underreporting bias.

47   The sample was pulled from Glassdoor's salary database on November 24, 2015. Full-time workers only are included in the sample.

48   For our regression estimates, we remove from the sample 18 individuals (0.45 percent of the sample) misreporting earnings as less than the 2006 Australia minimum wage for full-time workers, or A$25,000 per year (Source: http://gldr.co/1QyjSRB). Including these individuals does not materially affect any estimates in this study. All salaries reported as hourly wages are expressed in annual terms assuming a 2,000-hour full-time work year.

Table 5. Summary Statistics for the Australia Salary Sample

| Variable	Observations	Mean	Standard Deviation	Min	Max
Year	4,044	n.a.	n.a.	2006	2015
Base Salary	4,044	AUD$96,282	AUD$41,529	AUD$25,625	AUD$453,863
Total Compensation	4,044	AUD$111,072	AUD$112,185	AUD$25,625	AUD$3,773,000
Gender (Male = 1)	4,044	0.77	0.42	0	1
Birth Year	4,044	1980	7.9	1927	1997
Years of Experience	4,044	6.3	5.6	0	58
Associate Degree	4,044	0.01	0.11	0	1
Bachelor's Degree	4,044	0.59	0.49	0	1
High School Diploma	4,044	0.08	0.27	0	1
J.D.	4,044	0.00	0.03	0	1
Master's Degree	4,044	0.27	0.44	0	1
M.B.A.	4,044	0.03	0.17	0	1
M.D.	4,044	0.00	0.03	0	1
Ph.D.	4,044	0.01	0.12	0	1
Firm Size (# Employees)	4,044	9,236	6,436	25	15,000

Comparing Similar Workers

Figure 11 presents our estimates of the "unadjusted" and "adjusted" gender pay gap in Australia salaries from Glassdoor. Column 1 shows the "unadjusted" pay gap with no statistical controls for differences between workers or jobs. Overall, there is a 17.3 percent "unadjusted" gap in base pay between males and females, and a 17.8 percent gender pay gap in total compensation. Applying controls for age, education and years of experience, the gender pay gap in column 2 shrinks to 12.0 percent for base pay and 12.6 percent for total compensation. Finally adding in a rich set of controls for company and job title, in column 5 we find an "adjusted" gender pay gap of 3.9 percent for base pay and 5.4 percent for total compensation.

Figure 11. Overall Australia Results: Estimates of the "Unadjusted" and "Adjusted" Gender Pay Gap for Comparable Workers
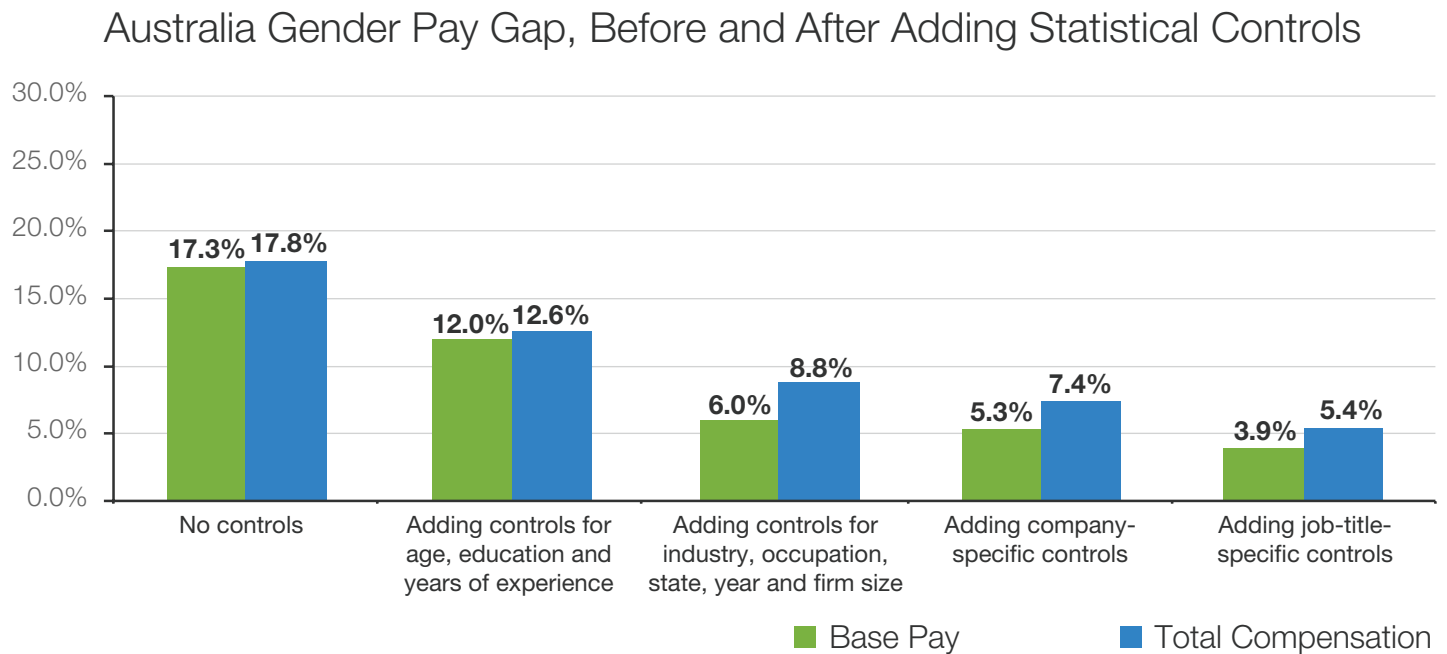
Australia Gender Pay Gap, Before and After Adding Statistical Controls

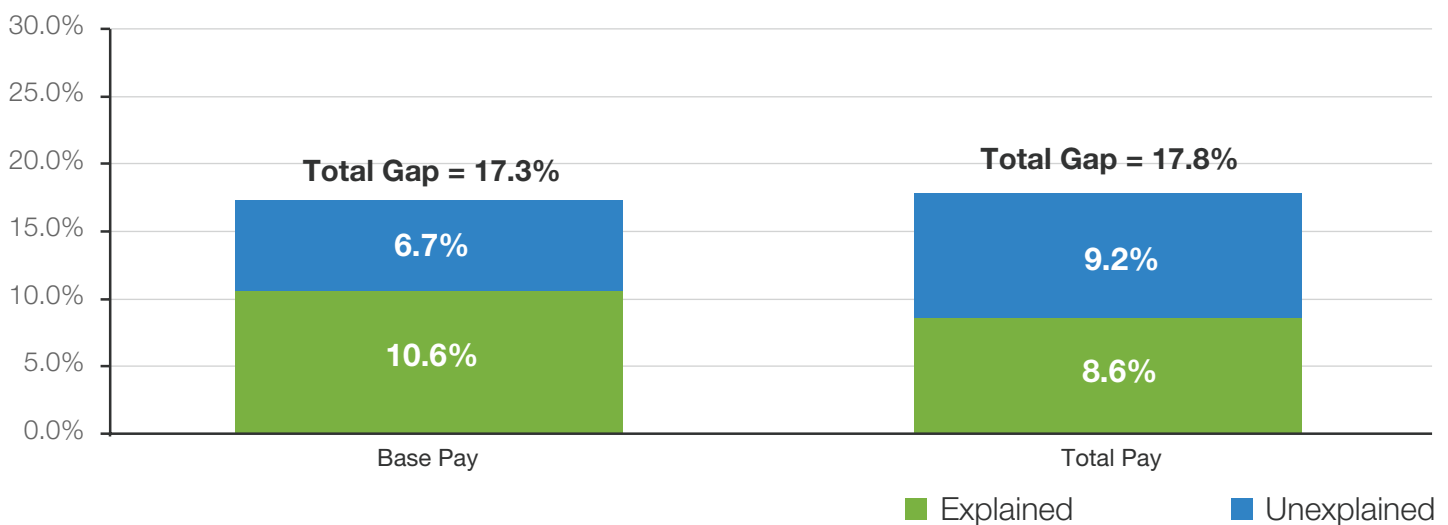Source: Glassdoor Economic Research (Glassdoor.com/research)

Figure 12 shows the decomposition of the Australia gender pay gap in Glassdoor salary data into the portion that is "explained" by differences in worker characteristics and the portion that remains "unexplained" due either to unobserved factors or subtle forms of workplace discrimination.

Of the overall 17.3 percent gender gap in base pay, 10.6 percent (or 61 percent of the total gap) is explained by differences in worker characteristics, while the remaining 6.7 percent (or 39 percent of the total gap) is unexplained. This finding means that about 61 percent (10.6/17.3 = 61 percent) of the overall Australia gender pay gap in base pay is explained by worker characteristics. The remaining 39 percent is unexplained and due to differences in the way the labor market rewards men and women with the same characteristics.

In the Appendix, we provide full details of the Oaxaca-Blinder decomposition for Australia. In those tables, we see that of the roughly 61 percent of the gender gap that is explained, 38 percent is due to sorting of men and women into different industries and occupations, while just 24 percent is due to differences in education and experience between males and females. Put differently, individual worker characteristics explain only about one-fourth of the Australia gender pay gap, nearly identical to our finding for the U.K. By contrast, the fact that men and women systematically work in different roles explains 38 percent—by far the largest factor explaining gender pay differences in our sample.

Figure 12. Decomposing the Australia Gender Pay Gap into "Explained" and "Unexplained" Portions

Australia Explained and Unexplained Gender Pay Gap
(Oaxaca-Blinder Decomposition)

Source: Glassdoor Economic Research (Glassdoor.com/research)
Note: Includes controls for age, education, experience, industry, occupation, year, state and company size.

Germany's Federal Statistical Office (Destatis) estimates that the German gender pay gap is roughly 21.6 percent in 2015.[49] In our sample of Glassdoor salary data, we find a broadly comparable gender pay gap reported by online German employees. For our analysis, we use a sample of 1,603 Glassdoor salaries reported by German employees. As in our U.S. sample, we restrict our analysis to workers over age 16 working full time for whom we have basic demographic information such as age, education and years of experience.

In our Glassdoor Germany salary sample, the average base pay was €60,990 per year for men and €49,037 for women. That amounts to a gender pay gap of €11,953 in base pay between men and women, or roughly 19.6 percent of average male pay. That amounts to German women earning roughly 80 cents for every dollar earned by men on average. In terms of median pay the German gender gap is slightly smaller at 17.4 percent. The unadjusted gender pay gap for total compensation in Germany is slightly smaller than for base pay: 6.4 percent for mean total compensation and 16.9 percent for median total pay.[50]

Table 6 provides a summary of the Germany sample used in our regression analysis. The sample contains 1,603 salaries reported from calendar years 2007 through 2015.[51] The data contain information on approximately 770 unique German employers and 690 job titles. The average base pay in the sample was €58,895, ranging from €6,054 to a high of €953,470.[52] Average total compensation was significantly higher at €84,221. The sample is 82 percent male and 18 percent female, and the average age (as of 2015) was 34 years with 5.6 years of relevant work experience. Forty-eight percent of the sample had bachelor's degrees, 35 percent had master's degrees, and 7 percent had only a high school diploma. The average employer size was 9,123 employees, ranging from small 25-person firms to employers with 200,000 employees.

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[49] Source: German Federal Statistical Office (Destatis), at http://gldr.co/1TG58Xv.

[50] As with U.S. salary data, we focus on base pay in our analysis and provide figures for total compensation as an illustration only. We suggest caution in interpreting total compensation figures due to potentially large underreporting bias.

[51] The sample was pulled from Glassdoor's salary database on November 24, 2015. Full-time workers only are included in the sample.

[52] All salaries reported as hourly wages are expressed in annual terms assuming a 2,000-hour full-time work year.

Table 6. Summary Statistics for the Germany Salary Sample

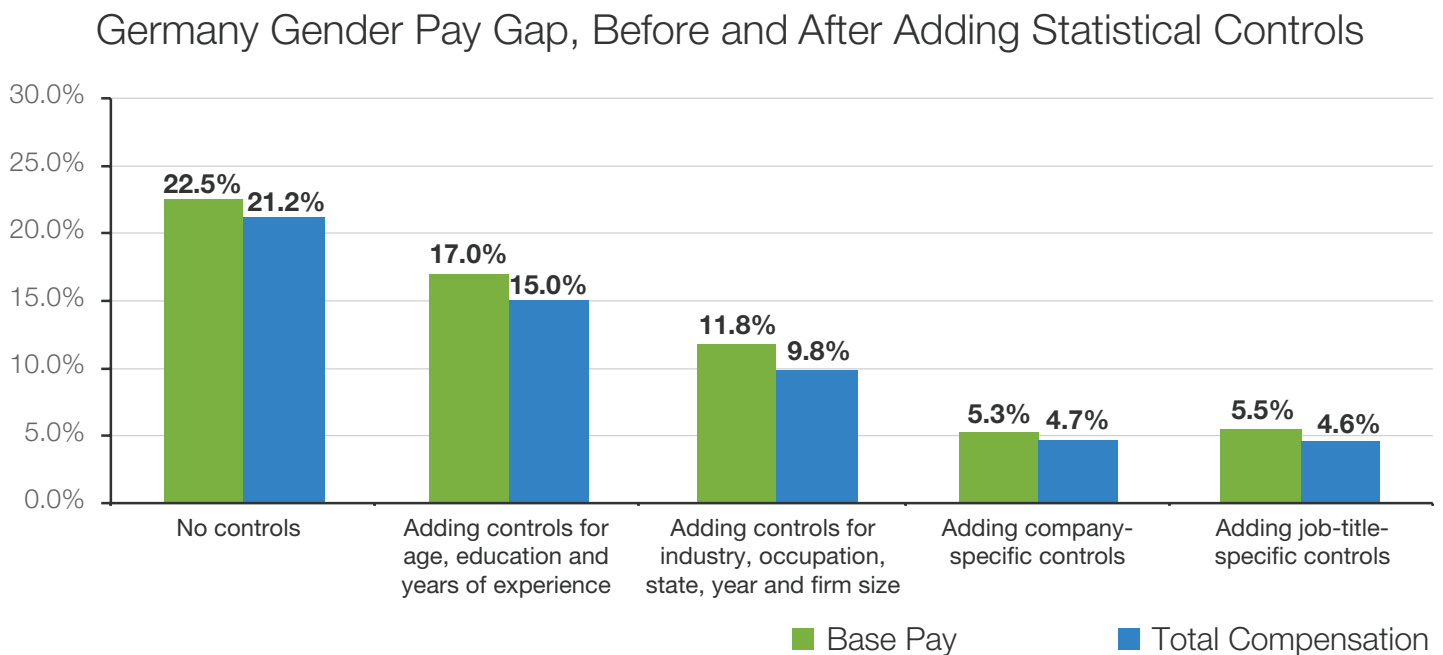| Variable	Observations	Mean	Standard Deviation	Min	Max
Year	1,603	n.a.	n.a.	2007	2015
Base Salary	1,603	€58,895	€34,743	€6,054	€953,470
Total Compensation	1,603	€84,221	€203,684	€6,054	€4,724,837
Gender (Male = 1)	1,603	0.82	0.38	0	1
Birth Year	1,603	1981	7.6	1942	1998
Years of Experience	1,603	5.6	5.1	0	33
Associate Degree	1,603	0.01	0.10	0	1
Bachelor's Degree	1,603	0.48	0.50	0	1
High School Diploma	1,603	0.07	0.25	0	1
J.D.	1,603	0.01	0.08	0	1
Master's Degree	1,603	0.35	0.48	0	1
M.B.A.	1,603	0.05	0.22	0	1
M.D.	1,603	0.00	0.04	0	1
Ph.D.	1,603	0.03	0.17	0	1
Firm Size (# Employees)	1,603	9,123	12,530	25	200,000

Comparing Similar Workers

Figure 13 presents our estimates of the "unadjusted" and "adjusted" gender pay gap in German salaries from Glassdoor. Column 1 shows the "unadjusted" pay gap with no statistical controls for differences between workers or jobs. Overall, there is a 22.5 percent "unadjusted" gap in base pay between males and females, and a 21.2 percent gender pay gap in total compensation. Applying controls for age, education and years of experience, the gender pay gap in column 2 shrinks to 17.0 percent for base pay, and 15.0 percent for total compensation. Finally adding in a rich set of controls for company and job title, in column 5 we find an "adjusted" gender pay gap of 5.5 percent for base pay and 4.6 percent for total compensation.

Figure 13. Overall Germany Results: Estimates of the "Unadjusted" and "Adjusted" Gender Pay Gap for Comparable Workers

Germany Gender Pay Gap, Before and After Adding Statistical Controls

	Base Pay	Total Compensation
No controls	22.5%	21.2%
Adding controls for age, education and years of experience	17.0%	15.0%
Adding controls for industry, occupation, state, year and firm size	11.8%	9.8%
Adding company-specific controls	5.3%	4.7%
Adding job-title-specific controls	5.5%	4.6%

Source: Glassdoor Economic Research (Glassdoor.com/research)
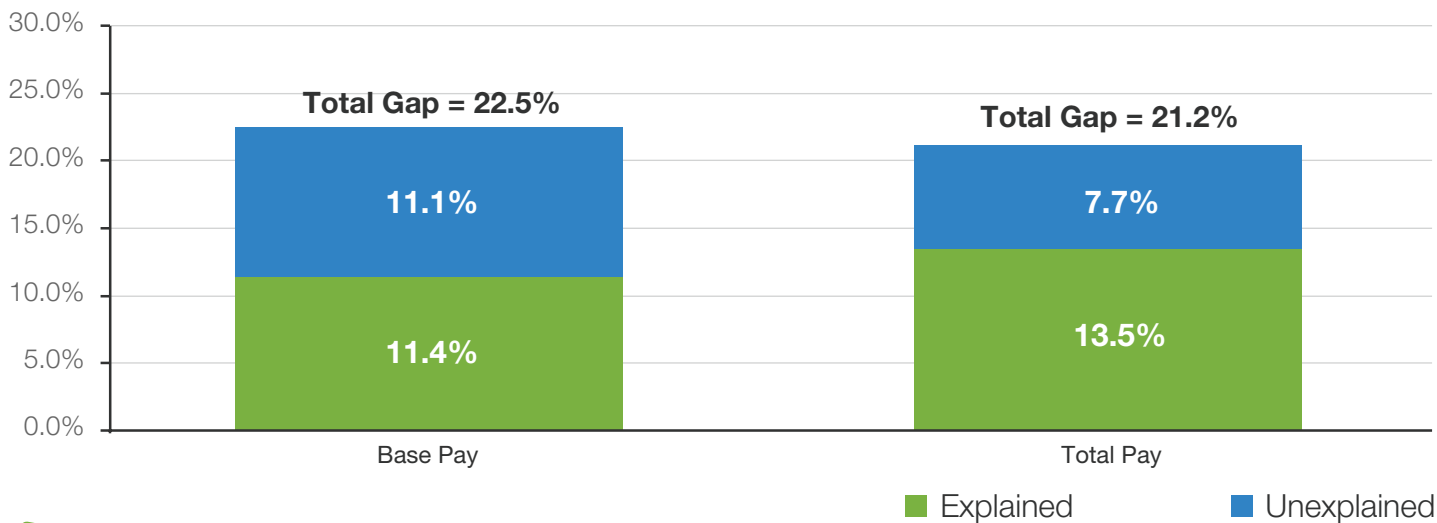
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Figure 14 shows the decomposition of the German gender pay gap in Glassdoor salary data into the portion that is "explained" by differences in worker characteristics and the portion that remains "unexplained" due either to unobserved factors or subtle forms of workplace bias and discrimination.

Of the overall 22.5 percent gender gap in base pay, 11.4 percent (or 51 percent of the total gap) is explained by differences in worker characteristics, while the remaining 11.1 percent (or 49 percent of the total gap) is unexplained. This finding means that about 51 percent (11.4/22.5 = 51 percent) of the overall Germany gender pay gap in base pay is explained by worker characteristics. The remaining 49 percent is unexplained and due to differences in the way the labor market rewards men and women with the same characteristics.

In the Appendix, we provide full details of the Oaxaca-Blinder decomposition for Germany. In those tables, we see that of the roughly 51 percent of the gender gap that is explained, 28 percent is due to sorting of men and women into different industries and occupations, while just over 22 percent is due to differences in education and experience between males and females.[53] Put differently, individual worker characteristics explain only about 22 percent of the Germany gender pay gap, comparable to our findings in the U.K. and Australia. By contrast, the fact that men and women systematically work in different roles explains 28 percent—the single largest factor explaining gender pay differences in our sample.

Figure 14. Decomposing the Germany Gender Pay Gap into "Explained" and "Unexplained" Portions

Germany Explained and Unexplained Gender Pay Gap
(Oaxaca-Blinder Decomposition)

Source: Glassdoor Economic Research (Glassdoor.com/research)
Notes: Includes controls for age, education, experience, industry, occupation, year, state and company size.

[53] Percentages do not add to the total due to rounding of individual figures.

The European Commission's statistical office (Eurostat) estimates that the French gender pay gap was roughly 15.3 percent in 2014.[54] In our sample of Glassdoor salary data, we find a broadly comparable gender pay gap reported by online French employees. For our analysis, we use a sample of 1,049 Glassdoor salaries reported by French employees. As in our U.S. sample we restrict our analysis to workers over age 16 working full time for whom we have basic demographic information such as age, education and years of experience.

In our Glassdoor France salary sample, the average base pay was €53,026 per year for men and €45,060 for women. That amounts to a gender pay gap of €7,966 in base pay between men and women, or roughly 15.0 percent of average male pay. That amounts to French women earning roughly 85 cents for every dollar earned by men on average. In terms of median base pay the French gender gap is slightly smaller at 11.3 percent. The unadjusted gender pay gap for median total compensation in France is somewhat larger, at 13.9 percent.[55]

Table 7 provides a summary of the France sample used in our regression analysis. The sample contains 1,049 salaries reported from calendar years 2007 through 2015.[56] The data contain information on approximately 550 unique France employers and 530 job titles. The average base pay in the sample was €51,401, ranging from €16,738 to a high of €252,000.[57] Average total compensation was significantly higher at €86,134. The sample is 80 percent male and 20 percent female, and the average age (as of 2015) was 33 years with 5.6 years of relevant work experience. Thirty-seven percent of the sample had bachelor's degrees, 51 percent had master's degrees, and 3 percent had only a high school diploma. The average employer size was 8,337 employees, ranging from small 25-person firms to employers with 15,000 employees.

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[54] Source: European Union's Eurostat, at http://gldr.co/1WJ2nmg.

[55] As with U.S. salary data, we focus on base pay in our analysis and provide figures for total compensation as an illustration only. We suggest caution in interpreting total compensation figures due to potentially large underreporting bias.

[56] The sample was pulled from Glassdoor's salary database on November 24, 2015. Full-time workers only are included in the sample.

[57] For our regression estimates, we remove from the sample 24 individuals (2.3 percent of the sample) misreporting earnings as less than the 2006 France minimum wage of €8.27 per hour worked at 2,000 hours per year, or €16,540 per year (Source: France National Institute of Statistics and Economic Studies, at http://gldr.co/1p4Jaks). Including these individuals does not materially affect any estimates in this study. All salaries reported as hourly wages are expressed in annual terms assuming a 2,000-hour full-time work year.

Table 7. Summary Statistics for the France Salary Sample

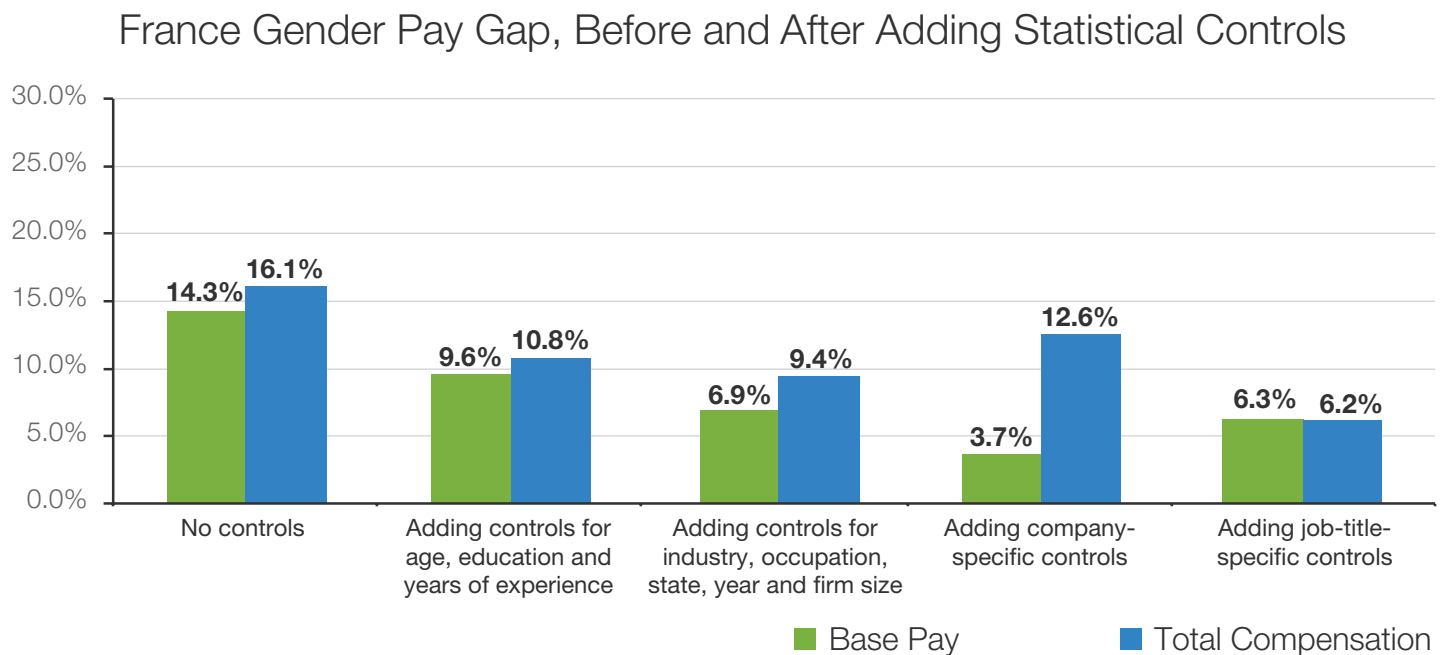| Variable	Observations	Mean	Standard Deviation	Min	Max
Year	1,049	n.a.	n.a.	2007	2015
Base Salary	1,049	€51,401	€26,060	€16,738	€252,000
Total Compensation	1,049	€86,134	€249,632	€16,738	€4,852,000
Gender (Male = 1)	1,049	0.80	0.40	0	1
Birth Year	1,049	1982	7.1	1940	1996
Years of Experience	1,049	5.6	5.4	0	35
Associate Degree	1,049	0.01	0.09	0	1
Bachelor's Degree	1,049	0.37	0.48	0	1
High School Diploma	1,049	0.03	0.18	0	1
J.D.	1,049	0.00	0.03	0	1
Master's Degree	1,049	0.51	0.50	0	1
M.B.A.	1,049	0.06	0.23	0	1
M.D.	1,049	0.00	0.06	0	1
Ph.D.	1,049	0.02	0.14	0	1
Firm Size (# Employees)	1,049	8,337	6,582	25	15,000

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Comparing Similar Workers

Figure 15 presents our estimates of the "unadjusted" and "adjusted" gender pay gap in France salaries from Glassdoor. Column 1 shows the "unadjusted" pay gap with no statistical controls for differences between workers or jobs. Overall, there is a 14.3 percent "unadjusted" gap in base pay between males and females, and a 16.1 percent gender pay gap in total compensation. Applying controls for age, education and years of experience, the gender pay gap in column 2 shrinks to 9.6 percent for base pay, and 10.8 percent for total compensation. Finally adding in a rich set of controls for company and job title, in column 5 we find an "adjusted" gender pay gap of 6.3 percent for base pay and 6.2 percent for total compensation.

Figure 15. Overall France Results: Estimates of the "Unadjusted" and "Adjusted" Gender Pay Gap for Comparable Workers

France Gender Pay Gap, Before and After Adding Statistical Controls

	No controls	Adding controls for age, education and years of experience	Adding controls for industry, occupation, state, year and firm size	Adding company-specific controls	Adding job-title-specific controls
Base Pay	14.3%	9.6%	6.9%	3.7%	6.3%
Total Compensation	16.1%	10.8%	9.4%	12.6%	6.2%

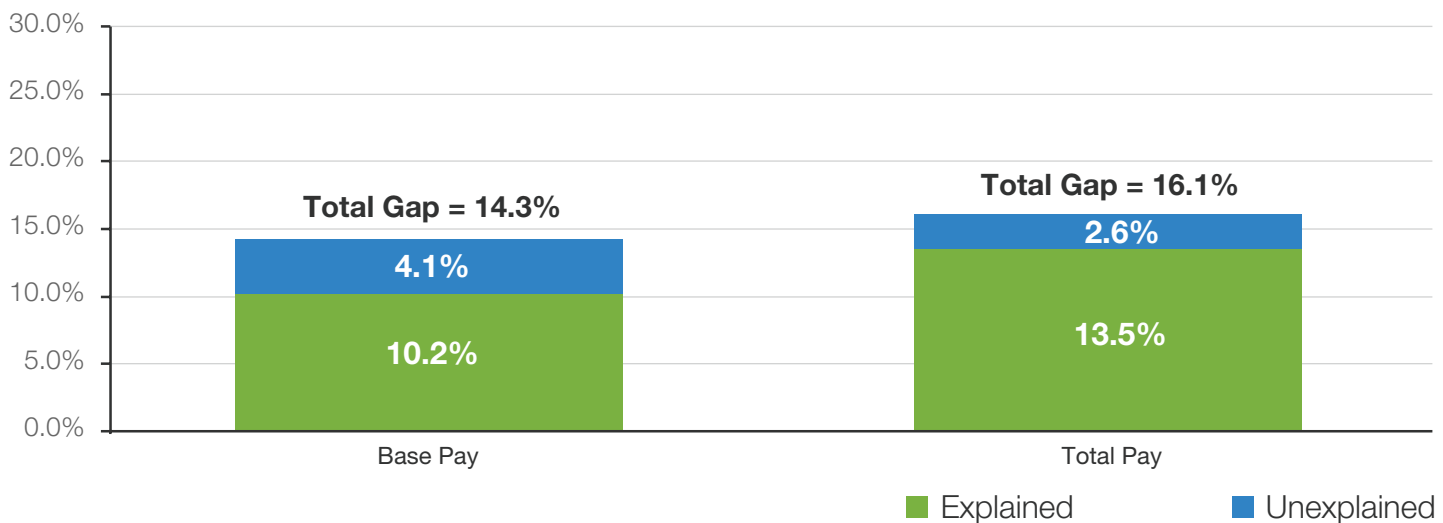*Source: Glassdoor Economic Research (Glassdoor.com/research)*

Figure 16 shows the decomposition of the France gender pay gap in Glassdoor salary data into the portion that is "explained" by differences in worker characteristics and the portion that remains "unexplained" due either to unobserved factors or subtle forms of workplace bias and discrimination.

Of the overall 14.3 percent gender gap in base pay, 10.2 percent (or 71 percent of the total gap) is explained by differences in worker characteristics, while the remaining 4.1 percent (or 29 percent of the total gap) is unexplained. This finding means that about 71 percent (10.2/14.3 = 71 percent) of the overall France gender pay gap in base pay is explained by worker characteristics. The remaining 29 percent is unexplained and due to differences in the way the labor market rewards men and women with the same characteristics.

In the Appendix, we provide full details of the Oaxaca-Blinder decomposition for France. In those tables, we see that of the roughly 71 percent of the gender gap that is explained, 50 percent is due to sorting of men and women into different industries and occupations, while just over 21 percent is due to differences in education and experience between males and females. Put differently, individual worker characteristics explain only about 21 percent of the France gender pay gap, comparable to our findings in the U.K., Australia, and Germany. By contrast, the fact that men and women systematically work in different roles explains 50 percent—the single largest factor explaining gender pay differences in our sample.

Figure 16. Decomposing the France Gender Pay Gap into "Explained" and "Unexplained" Portions

France Explained and Unexplained Gender Pay Gap
(Oaxaca-Blinder Decomposition)

Source: Glassdoor Economic Research (Glassdoor.com/research)
Notes: Includes controls for age, education, experience, industry, occupation, year, state and company size.

V. Limitations to Keep in Mind

This study provides a new perspective on the gender pay gap using data from Glassdoor salaries in five countries. Although these unique data have many advantages over traditional sources of salary information like government surveys, they have important limitations as well. It's important to keep the following limitations in mind when interpreting the findings of this study.

- REPRESENTATIVENESS:
  The summary statistics for each country show that Glassdoor salary data may be generally representative of online employees, but not necessarily the overall workforce. Specifically, lower-income workers with a high school diploma or less education are generally underrepresented in Glassdoor salary samples, and males with a college degree or more education are overrepresented. Our estimates of the gender pay gap among online employees may not provide a fully representative view of the male-female pay gap among the larger general population.

- UNOBSERVED WORKER CHARACTERISTICS:
  To ensure we're making an apples-to-apples comparison between male and female workers, we control for every observable worker characteristics we have available in our estimates of the gender pay gap. This includes controls for age, highest level of education, years of experience, and a variety of job and industry characteristics. However, we are unable to observe many personal characteristics such as race/ethnicity, marital status, the presence of children, or innate worker ability—all of which are known to have a large effect on gender pay differences. Our estimates of the "adjusted" gender pay gap likely suffer from some degree of bias due to these unobserved factors.

- UNDERREPORTED TOTAL COMPENSATION:
  Although base pay is a required field in Glassdoor salary surveys, total compensation—including tips, commissions, bonus and other non-wage compensation—is optional. As a result, figures for total compensation may suffer from systematic underreporting by employees. To the extent that these data are missing disproportionately for females compared to males (or vice versa), this can lead to biased statistical estimates of the gender pay gap in total compensation. For this reason, we base all of our conclusions on findings for base pay, and recommend caution in interpreting figures for total compensation in this study.

VI. Conclusion: Thinking About the Gender Pay Gap

What lessons can we draw about the gender pay gap from our analysis of Glassdoor salary data? The first lesson is clear: The gender pay gap is a real labor market phenomenon, both in the U.S. and around the world. Even when we statistically compare workers with similar job titles, at similar employers, with comparable education, experience and locations, we still find a large and statistically significant difference between male and female pay.

Before any statistical controls, men earn on average between 14.3 percent and 24.1 percent more than women across the five countries we examined, ranging from the smallest "unadjusted" gender gap in France (14.3 percent) and the largest pay gap in the United States (24.1 percent). Once we statistically control for every difference we're able to observe between men and women—including job title and specific employer names—we still find an "adjusted" gender pay gap internationally, ranging between 3.9 percent in Australia and 6.3 percent in France. This amounts to women earning on average between 94 cents and 96 cents per dollar earned by men. Although those gaps are smaller than appear from a simple comparison of average male and female pay, they are a large and statistically significant difference between male and female earnings.

Gender Roles Matter

An often-overlooked point in gender pay gap studies is that just because the gap in male-female wages declines when we statistically control for worker characteristics, doesn't mean the gap is not real or caused by unfair barriers women face in the workplace. For example, if women are systematically excluded from certain occupations, or encouraged to work only in certain industries, or discouraged from pursuing particular college majors, these factors can statistically "explain" the gender pay gap but still represent social biases against women that most observers would consider unfair and worthy of criticism.

One of the most important findings of this study is that differences in education, age and experience—what economists call "human capital" of workers—explains a trivially small part of the gender pay gap between men and women. This is true in every country we examined. As women have closed the gap in rates of college education and labor force participation in recent decades, less and less of the pay difference between men and women can be explained by gender differences in skills and education.

Instead, the vast majority of the gender gap today is caused by one important factor: *sorting of men and women* into systematically different occupations and industries throughout the economy. In our data, the choice of occupation and industry explains between 28 percent and 54 percent of the gender pay gap across the five countries we examined. In every country, we find occupation and industry sorting is by far the largest contributing factor to the "explained" gender pay gap—far larger than worker characteristics. This finding is consistent with other academic studies.[58]

Improving Free Occupational Choice

An intelligent way to design policies aimed at closing the gender pay gap is to *focus on the biggest factors causing it*. Although overt workplace discrimination almost certainly still occurs, the data make clear that intentional employer bias can only account for a small fraction of the overall gender pay gap in the countries we've examined. Though policies that address workplace discrimination are important, focusing on policies that target the dramatic occupation and industry sorting of men and women into separate and financially unequal types of work throughout their careers can help alleviate the gender pay gap by addressing its most important causes.

For example, research has shown that women disproportionately tend to be primary caregivers for children and the elderly in families, and that this can lead women to sort into lower-paying occupations offering more flexibility.[59] This is an example of occupational choice that can be statistically controlled for, but is heavily influenced by social norms largely beyond the control of individual female workers. Similarly, occupation and industry sorting is heavily affected by institutions that lead men and women down different paths through the education system, pressures that divert men and women into different college majors and career tracks, and a variety of social norms regarding family responsibilities.

[58]   See for example Blau and Khan (2016).
[59]   See Goldin (2015).

In these cases, societal and public policy encouraging more equal access to science, technology and health care training, targeted initiatives to encourage career growth and advancement among female business leadership, and policies that support child care and assistance for the elderly may help address the root causes of these types of occupational and industry differences between male and female workers.

Expanding Pay Transparency

A second example of a policy not explicitly aimed at gender pay but which can help narrow the gap over time is greater workplace transparency. A large number of academic studies find salary transparency can help eliminate male-female pay differences.[60] For example, a 2012 study by economists Andreas Leibbrandt and John List found that a major contributor to the gender pay gap is a negotiation gap.[61] Women are less likely to negotiate over salary than men. But when researchers explicitly told job seekers that pay was negotiable, the gender gap disappeared. Recognizing this power of transparency to eliminate pay gaps, many legal scholars have called for mandatory pay transparency among U.S. employers—a proposal endorsed by the Obama administration in 2016.[62]

Although equity in gender pay has improved dramatically in recent decades, Glassdoor data suggest there remains much to be done. By shedding light on today's patterns in gender pay differences among online employees, we hope to encourage a healthy dialogue among job seekers, employers, and policymakers in coming years.

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[60] See For an overview of research on how salary transparency affects gender pay differences, see Chamberlain (2015).
[61] See Liebbrandt and List (2012).
[62] See White House (2016).

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