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Article — Published Version Equal pay behind the "Glass Door"? The gender gap in upper management in a male-dominated industry

Gender, Work & Organization

Provided in Cooperation with: John Wiley & Sons

Suggested Citation: Kräft, Charlotte (2022) : Equal pay behind the "Glass Door"? The gender gap in upper management in a male-dominated industry, Gender, Work & Organization, ISSN 1468-0432, Wiley, Hoboken, NJ, Vol. 29, Iss. 6, pp. 1910-1926, https://doi.org/10.1111/gwao.12890

This Version is available at: https://hdl.handle.net/10419/266765

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Equal pay behind the "Glass Door"? The gender gap in upper management in a male-dominated industry

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Funding statement

Open Access funding enabled and organized by Projekt DEAL.

Abstract

The present paper explores the two components of the glass ceiling effect: promotion barriers for women to the executive sphere and a gender-based differential in executive pay. The research setting is the British oil industry, which constitutes a male-dominated sector. Analyzing both components separately, the results suggest that females are promoted more frequently to the executive ranks while they experience a pay bias compared to men. Thus, the analysis reveals that the glass ceiling is cracking in this gender-imbalanced industry. Yet, pay discrimination still exists. However, within the narrow corridor of executives, the present study suggests that gender pay discrimination diminishes the higher one who climbs up the executive ladder. The latter finding raises the cynical question: How far up the hierarchy ladder does a woman need to climb to overcome gender-based pay discrimination?

KEYWORDS

decomposition, executive labor market, gender bias in promotion, gender pay gap, glass ceiling, male-dominated industry, pay discrimination

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1 | INTRODUCTION

It is a well-documented fact that the executive spheres of companies are largely dominated by men (e.g., Catalyst, 2020). The phenomenon that women face an invisible barrier that prevents them from attaining executive positions is called "glass door" or "glass ceiling effect" (Federal Glass Ceiling Commission, 1995). An indicator for the existence and economic relevance of the glass ceiling effect is the fact that, nowadays, many women complete their A-levels¹ and university studies successfully, often even more successfully than men (Kolster & Kaiser, 2015). From a human capital perspective, these endowments should enable them to pursue a promising career. However, female representation in corporate boardrooms and management is drastically low (Catalyst, 2020). The essential question is that where have all the (capable) women gone?

Referring to the glass ceiling effect's magnitude in a male-dominated industry, one might argue that the glass ceiling there is especially thick, made of bulletproof glass, in such kind of extremely gender-imbalanced industry setting. The executive sphere in a traditionally male-dominated industry is supposed to be an "old boy's network" where masculine communication patterns are salient, and related power and network structures dominate (e.g., Germain et al., 2012; Taylor, 2010; Walker & Bopp, 2011; Watts, 2009). Thus, it might symbolize a "dead zone" for any woman. Not surprisingly, it is the male-dominated industry where a lot of political attention is directed to in order to change the gender proportion of its workforce. That said, male-dominated industries should become rather a relict than remain a reality.

Yet, how to change the gender proportion in a male-dominated industry? Theory suggests that it is all about the female leader, the "critical actor" who brings about positive changes for women (Dahlerup, 1988). While the critical mass theory advocates that it needs a critical mass to change the position of the minority considerably (Kanter, 1977), proponents of the critical actor theory argue that individual critical actors are crucial. Critical actors act on behalf of women as a group, initiate proposals, and encourage others to follow (Childs & Krook, 2006). Both theories form the basis of female quota regulations for boardrooms and top management recently introduced in many industrialized countries (Seierstad & Huse, 2017).²

Consequently, the main notion of getting women into leadership is to initiate a virtuous cycle: Consistent with the critical actor theory, female leaders are supposed to act as critical actors who bring about positive changes for women, which will ultimately rebound to their working conditions and labor force proportion. This argument is especially valid for male-dominated industries. Against the background of the significance of female leaders in a male-dominated industry, it is quite surprising that no empirical study exists that analyzes the glass ceiling effect in a male-dominated setting. The present paper aims to bridge this gap.

Our research has analyzed the glass ceiling effect in a male-dominated setting, the British oil and gas industry. The data set has been derived from the international consulting firm hkp/// group. It contains the personnel data of white-collar, full-time workers in the British oil and gas industry from 2011 to 2014. The sample includes 8072 individual workers and a total of 18,089 observations from 13 companies whose major business activity is producing crude oil and gas. The proportion of females for the entire data set is 12.0%; for the executive sphere it amounts to 6.0% underlining the clear male dominance of this sector. We have also explored the following two elements of the glass ceiling effect: the *invisible barrier effect*, indicating promotion obstacles for women, and the *pay gap effect*, which alludes to the fact that male executives earn higher total wages than female executives. Thus, we aim to close critical research gaps by answering these two questions:

- (1) Are women less likely to be promoted to the top hierarchies than men (other things being equal)?
- (2) Do male executives earn more in total salary than female executives (other things being equal)?

We analyze our research questions using a differentiated methodological framework, a random-effects probit model and a quantile decomposition technique.

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2 | LITERATURE REVIEW

2.1 | The glass ceiling effect

The expression "glass ceiling" first appeared in *The Wall Street Journal* in 1986 (Hymowitz & Schellhardt, 1986). It is used as a metaphor capturing the symbolic dimensions of discrimination against women in the senior hierarchies of organizations as inequalities cannot be explained by job-relevant characteristics (e.g., Altman et al., 2005; Cortina, 2008; Cotter et al., 2001; Davidson & Cooper, 1992; Dreher, 2003; Morrison et al., 1987; Stroh et al., 2004).³ While in general, women's persistent underrepresentation in the top hierarchies remains a puzzle (Gorman & Kmec, 2009); mechanisms in which they are prevented from entering the career pipeline are for example, the lack of an exclusive network (Braddock & McPartland, 1987); a mentor (Chao, 1997); adequate on-the-job training (Kanter, 1977) and lastly, certain prejudices toward women's social roles, abilities and in general, discriminatory attitudes toward women (Gorman & Kmec, 2009; Ridgeway, 2001). The latter argument is based on in-group favoritism that leads men to prefer other men for executive positions (homosocial reproduction), and sex categorization and related stereotypes that lead decision-makers to view women as less capable executives (Reskin, 2000; Ridgeway, 1997; Ridgeway & England, 2007).

The glass ceiling effect has been operationalized by analyzing authority levels (Wright et al., 1995), pay inequalities (e.g., Morgan, 1998; Bertrand & Hallock, 2001), or chances for promotion (Baxter & Wright, 2000; Maume, 2004).

Critiques of the glass ceiling metaphor contend that it fails to describe that women are not only inhibited by a single ceiling above them but by barriers that surround them (Meyerson & Fletcher, 2000): Hidden barriers to gender equality might be found in many areas of an organization for example, in recruitment and selection processes or design of work (Olgiati & Shapiro, 2002). Moreover, since economic and societal contexts have changed since the 1980s, the term might not capture the complexity of today's typical working situation. The traditional career models have been disrupted through virtualization or fast job rotation to more flexible and diverse career paths in and outside an organization worldwide. There is doubt if the glass ceiling effect reflects these developments (Bendl & Schmidt, 2010).

Despite the criticism, the glass ceiling metaphor does not lose its importance in explaining organizational outcomes. Acker (1990, 2006) concludes that the glass ceiling effect is crucial to understanding the formation of the gendered organization and the perpetuation of "inequality regimes": Men have monopolized the most desirable positions in organizations, and women are excluded from executive power. Only access to managerial positions enables women to influence outcomes and processes (Baron, 1991; Marini, 1989). Following this notion, the significance of the glass ceiling effect was reinforced at a political level by introducing female quotas for boardroom representation in many industrialized countries.⁴

2.2 | Research on the glass ceiling effect

There are several empirical attempts to analyze the glass ceiling effect. The studies can be broadly distinguished into three groups: (i) studies at **country level**; (ii) studies at the **executive market level**; and lastly, (iii) studies that work with **matched employer-employee data**.

In the seminal work on the glass ceiling effect at the **country level** by Albrecht et al. (2003), Swedish data from 1998 were used to show that the gap between women and men accelerates at the top of the wage distribution. Similarly, Arulampalam et al. (2007) analyzed data of 11 European Union countries and found that the wage gaps were usually bigger at the top than at the remaining wage distribution underneath. In the same vein, glass ceilings at the country level have been found for the Netherlands (Albrecht et al., 2009); Spain (De la Rica et al., 2008); Denmark (Datta Gupta et al., 2006); West Germany (Fitzenberger & Wunderlich, 2002) and Australia (Kee, 2006). In contrast,

no glass ceiling has been detected for Switzerland (Bonjour & Gerfin, 2001). For the USA, findings are mixed (Baxter & Wright, 2000; Cotter et al., 2001; Datta Gupta et al., 2006; Miller, 2009).

When it comes to literature on the glass ceiling effect in the **executive labor market**, most studies exploit US data due to the availability of structured executive data. The pioneering work on the glass ceiling effect in this field can be traced back to Bertrand and Hallock (2001). They found a raw gender pay gap of 45% in their analysis of the top five executives in larger US companies from 1992 to 1997. However, this gap shrunk to an insignificant level once various company and industry controls were successively introduced into their regression model. Glass ceiling studies using the same data followed with different emphases, as the impact of female leaders on the glass ceiling effect (Bell, 2005) or the significance of a variable pay share to explain gender pay differences (Muñoz-Bullón, 2010).

The first piece of research focusing on both dimensions of the glass ceiling effect, namely gender differences in career mobility (*invisible barrier effect*) and compensation (*pay gap effect*), was conducted by Gayle et al. (2012). Once again, using the data source mentioned above on the United States, Gayle et al. (2012) found that female executives earned more in total compensation than male executives (contingent upon rank and background). Furthermore, they revealed that women were promoted internally more quickly than men. These results were contradictory to the notion of the glass ceiling effect. In the same vein, Gregory-Smith et al.'s (2014) analysis of gender bias in British boardrooms' appointment and pay systems found evidence of a gender bias in the appointment to boardrooms of nonexecutives, but none for executives. Furthermore, the raw wage gap of 20% shrunk to an insignificant level once controls were introduced, that is, for company characteristics, again contradicting the notion of a glass ceiling.

The third strand of literature on the glass ceiling effect works with nationally representative **matched employer-employee data**. These studies account for the contribution of gender segregation to the glass ceiling effect (e.g., for France: Jellal et al., 2008; for Morocco: Nordman & Wolff, 2009). This strand of research confirms the existence of a glass ceiling and shows that segregation of females into lower-paying occupations and industries accounts for a reasonable proportion of the glass ceiling effect.

The studies mentioned above help to further our understanding of the dynamics of the glass ceiling effect and show that it is a phenomenon with a large prevalence at country levels. For studies working with executive data, findings are mixed. We contribute to these apparently mixed findings at the executive market level by analyzing the glass ceiling effect in a male-dominated industry. Moreover, most existing studies are incomplete since they work exclusively with pay data, neglecting the invisible barrier effect (e.g., Jung & Cho, 2020; Morgan, 1998; Muñoz-Bullón, 2010). Our study analyzes both components of the glass ceiling effect and bridges these gaps.

3 | RESEARCH HYPOTHESES

The theory underlying the glass ceiling effect is not straightforward. Instead, it traverses a range of economic and sociological models. Thus, this section differentiates between the supply- and demand-side approaches and introduces two main theories.

Starting with the supply-side approach, there is naturally a large consensus that some key competencies are indispensable for pursuing a career. These are, among others, risk-taking, conducting negotiations, and performing under competitive pressure (Booth, 2009; Gerdes & Gränsmark, 2010). While it is not clear whether these attributes are inherently different in nature or have been explicitly nurtured regarding both genders, women and men tend to show different behavior when it comes to these core competencies. For instance, it has been reported that women tend to negotiate less successfully than their male counterparts (Gerhart, 1990; Stuhlmacher & Walters, 1999). This has been attributed to women having lower career and wage expectations before they start their actual careers (Filippin & Ichino, 2005; Frick & Maihaus, 2016). Another explanation for women's lower propensity to negotiate includes their limited outside options on the labor market, given that women have traditionally fulfilled household and childrearing obligations, which reduces their mobility and flexibility

(Keith & McWilliams, 1999). A further important finding is that women tend to be more risk-averse than men (Dohmen et al., 2011; Dohmen & Falk, 2011). When comparing one's career with an investment decision in line with the human capital theory, taking a risk is usually associated with higher returns and thus the promotion of one's career and wage intentions. Along this line, women tend to shy away from competition while men often even increase their performance in a competitive setting (Booth, 2009; Gerdes & Gränsmark, 2010; Gneezy et al., 2003; Niederle & Vesterlund, 2007). Given that specific jobs are limited within an organization, competitive behavior can facilitate promotion and is thus considered an accelerator for one's career and wage level (Gerdes & Gränsmark, 2010).

Referring to a demand-side approach, researchers have explained the glass ceiling effect regarding discriminatory attitudes and behavior. Becker (1971) assumed that individuals had a "taste for discrimination" that was linked to different labor market outcomes (p. 16). The basic notion inherent in Becker's work is that individuals have prejudices against a certain gender or ethnicity and that dealing with those individuals creates nonpecuniary costs. Assuming imperfect information, Arrow (1971) and Phelps (1972) developed their theory of statistical discrimination. Discrimination can be explained via certain beliefs in society that arise due to (i) former statistical experience, (ii) group stereotypes, and (iii) prevailing models. In the labor market context, employers link former experience with members of the same demographic group to the individual's unknown productivity. In contrast, average productivity of the majority group is assumed to exceed the average productivity of the minority group. Hence, workers who belong to the minority group suffer from poorer hiring outcomes.

Returning to the glass ceiling effect, women have historically formed a minority in the labor market due to traditional roles and family obligations outside this market (Datta Gupta & Smith, 2002). According to Becker's model, a taste against women might also prevail, causing a male dominance of workplace hierarchies. The executive sphere is considered to be very gender-imbalanced; women are usually tokens, that is, a very small minority. Tokenism within a group is characterized by the following three attributes: (i) *visibility*: tokens capture a disproportionate share of attention; (ii) *assimilation*: tokens' attributes are distorted for the sake of adaptation to the group; and (iii) *boundary heightening*: differences between the groups are stressed, resulting in isolation of the tokens (Kanter, 1977). Thus, an extreme gender imbalance is suggested to foster gender stereotypes and discrimination. Also, the supply-side explanation focusing on gender differences in social norms and noncognitive skills supports this view of female executives. Hence, former experience with female executives is limited, and the prevailing models and stereotypes advocate leadership associations with masculinity. This results in a potential for statistical discrimination, as suggested by Arrow (1971) and Phelps (1972).

In a male-dominated sector, women are usually tokens. While tokenism can be associated with positive outcomes under particular conditions, outcomes for female tokens are typically negative; female tokenism has been found to result in pay inequality (Jacobs, 1992) and hiring and promotion disparities (Cohen et al., 1998). Furthermore, studies on male-dominated workplaces have confirmed the negative consequences of female tokenism. Specifically, women are more likely than men to drop out of male-dominated fields (Frome et al., 2006; Germain et al., 2012). Women experience slower professional advancement with less representation at the top executive levels (Valian, 2004). Along this line, the glass ceiling effect might be a dominant phenomenon in the male-dominated sector due to women's tokenism and the associated undesirable outcomes.

Encompassing both dimensions of the glass ceiling effect, we consequently formulate our two research hypotheses as follows:

- **Hypothesis 1**: Female employees are significantly less likely to be promoted to the top hierarchies than male employees in a male-dominated industry, other things being equal (invisible barrier effect).
- **Hypothesis 2**: Male executives tend to earn a significantly higher total compensation than female executives in a male-dominated industry, other things being equal (pay gap effect).

4 | DATA SET AND VARIABLES

4.1 | Data

The data set has been derived from the Frankfurt-based consulting firm hkp///group. The hkp///group has granted permission to analyze and disclose the data set within this study. The data sample contains the personnel data of white-collar, full-time workers in the British oil and gas industry from 2011 to 2014. The sample includes 8072 individual workers and a total of 18,089 observations from 13 companies whose major business activity is producing oil and gas. Underlining the male dominance of this sector, 88% of the observations are from male workers, while 12% are from female workers. Although the sample covers data from companies with different hierarchies, the designation of hierarchical ranks has been standardized to seven. It does not include unskilled workers, CEOs, or managing directors. Both extremes are excluded at the top and on the bottom of the wage pyramid. Thus, the data set does not cover the whole personnel and is only limitedly representative. The highest hierarchy (rank 1) is attributed to managerial responsibility for business units, while the lowest hierarchical rank seven is linked to simple technical jobs without any managerial responsibility.

The individual performance measure is calculated as the ratio between the worker's *actual* and *target bonuses*. The *actual bonus* reflects the supervisor's evaluation of a worker's performance during the previous business year regarding his or her targets. This evaluation is based on three principles: how well the tasks are executed, the individual's output compared to what is considered normal in the job, and how accurate the worker follows instructions and regulations. The *target bonus* represents any form of annual variable pay that a worker at a given grade could typically expect, provided individual performance. This value's determination is based on the individual's previous performance and the performance level of peer groups. Therefore, the actual and target bonuses' ratio displays the deviation from the expected performance level. A deviation smaller than one implies poor performance, while a deviation larger than one implies high performance.

Additionally, the data set includes information on nine different functional areas an individual works in. Lastly, the data distinguish between three job locations: offshore, onshore production, and onshore nonproduction.

4.2 | Variables and descriptive statistics

Table 1 displays the main descriptive statistics of the relevant variables for the whole data set (1) versus the group of executives (2). Executives are all individuals who can be allocated to the hierarchical ranks 1 and 2. In total, these ranks include 2379 workers.

The dependent variables are *promotion* and *salary*. Promotion is a dichotomous variable indicating whether an individual has been promoted to another hierarchical rank within the employing company. It assigns the value of 0 in the case of no promotion, and correspondingly, the value of 1 in the case of a promotion to the next hierarchical level. The salary variable includes an individual's yearly total salary, hence the fixed and bonus salary sum. The mean total executive salary is considerably higher than the mean salary of the whole sample (150,760.4 GBP vs. 95,328.4 GBP). The minimum executive salary is roughly three times the minimum salary of the whole sample (72,226 GBP vs. 2,411,435 GBP). These descriptive values indicate a pronounced salary difference between executives and the entire data sample, while the numeric values of the promotion variable do not differ considerably (0.139 vs. 0.129). Next, only 6% of the executives are *female*, which is half of the average female share of 12%. All variables—other than gender—are salary-determining characteristics.

The average executive is older than the average worker (50.9 vs. 41.7 years). To account for potential nonlinear effects, age has been included in the linear and squared form. *Individual performance* refers to the worker's performance in the previous business year. Since only past performance can drive actual promotions and wages, performance has been considered in a time-lagged format. The executive's average individual performance attained in the previous

Variable	Definition	Mean (1)	Mean (2)	Std. Dev. (1)	Std. Dev. (2)	Min (1)	Min (2)	Max (1)	Max (2)
Dependent variabl	es								
Promotion	0 = no promotion, 1 = promotion	0.13	0.14			0	0	1	1
Salary	Total salary (fix and bonus)	95,328.40	150,760.40	38,045.17	32,508.04	24,114.35	72,226.00	407,702.00	407,702.00
Independent varia	bles								
Female	0 = male, 1 = female	0.12	0.06			0	0	1	1
Characteristics									
Age	Age of individual	41.72	50.86	9.77	5.83	22	26	69	68
Individual performance	Degree of individual target achievement, lagged	1.05	1.16	0.46	0.42	0.00	0.00	3.46	3.06
Company	Employing company					1	1	13	13
Year	Business year					2011	2011	2014	2014
Job function	 1 = commercial, 2 = discipline engin., 3 = general engin., 4 = geosciences, 5 = HSE, 6 = production engin., 7 = project engin., 8 = petroleum engin., 9 = well engin. 					1	1	6	0
Job location	1 = offshore, 2 = onshore non-production, 3 = onshore production					1	1	ო	ო
Categorization var	iable								
Hierarchical rank	Hierarchical rank, 1 = highest rank, 7 = lowest rank	4.32	1.66	1.60	0.47	1	t.	7	7
Note: (1) Descriptive	e statistics were obtained from 18,089 observation:	s. (2) Descripti	ve statistics we	rre obtained fn	om 2379 obse	rvations.			

Summary statistics of the main variables TABLE 1 Abbreviation: HSE, Health, Safety & Environment.

Source: hkp/// group remuneration data set, 2015.

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business year is also higher than for the entire sample (1.16 vs. 1.05). The detailed t-test results on (lagged) performance for female and male executives reveal that the average female value exceeds the male average performance value and that the mean difference is not different from zero. Thus, systematic gender bias on the part of the evaluator can be almost entirely excluded at this early stage of the analysis. We assume that individual performance mainly impacts salary and promotion in this private sector. Therefore, this variable is of utter importance in the analyses.

The variable *company* serves as a control to account for possible effects of corporate structure and size on promotion and salary. The variable *year* stands for the respective business year. *Year* is a trend variable that accounts for economic shifts. Including *job function* as a control variable accounts for different working conditions within a functional area and the related effects on promotion and salary. *Job location* is a proxy for different working conditions that stem from the diverse job locations. For example, only 4% of the offshore workers are female. The variable *hierarchical rank* allows for the representation of seven different hierarchical ranks.

5 | ESTIMATION STRATEGIES AND RESULTS

5.1 | Estimation strategy and results for the invisible barrier effect

In order to test our first hypothesis, that is, female employees are significantly less likely to be promoted to the top hierarchies than male employees in a male-dominated industry (other things being equal), we have used the following random-effects probit model:

$$promotion_{it} to rank 1 + 2 = \beta_0 + \beta_1 female_{it} + \beta_2 age_{it} + \beta_3 age_{it}^2 + \beta_4 performance_{it-1}$$

$$+ \beta_5 company_{it} + \beta_6 year_{it} + \beta_7 job function_{it} + \beta_8 job location_{it} + \mu_{it}$$
(1)

Table 2 contains the marginal effects of the respective independent variables on the promotion probability.

Table 2 shows that being female (as opposed to male) increases the likelihood of a promotion by 5.29% points. This effect is significant at the 5% level. The coefficients of age and age² are statistically significant, showing the typical curvilinear u-shape concerning the promotion probability. Concerning an individual's lagged performance, a 1% positive change in performance is linked to a rise in the probability of a promotion by 6.6% points, which is intuitively plausible. This finding is significant at the 5% level.

Likelihood of a promotion	Marginal effect
Female	0.0529**
	0.0254
Age	-0.0391**
	0.0015
Age ²	0.0003**
	0.0002
Individual performance	0.0658**
	0.0222
Observations	2379

TABLE 2 Marginal effects on the likelihood to be promoted

Note: Table 2 reports the average marginal effects of a random-effects probit regression on the probability of being promoted (Y = 1: employee was promoted to a higher rank). Robust standard errors are included (in italics). Estimations included job function, job location, company, and year controls.

*p < 0.10, **p < 0.05, ***p < 0.01.

Returning to our first hypothesis, that female employees are significantly less likely to be promoted to the top hierarchies than male employees in a male-dominated industry (other things being equal), it is now clear that it should be rejected. Contrary to this assumption, being female is associated with an increase in the likelihood of a promotion by 5.29% points. Generally, the results do not reveal an invisible barrier effect but instead affirm the existence of a "female premium" regarding internal promotion opportunities. We now proceed with investigating our second hypothesis that reflects the pay gap effect.

5.2 | Estimation strategy and the results pay gap effect

We have employed the following quantile regression model (in the manner of a Mincerian earnings function) in order to confirm our second hypothesis, that is, male executives tend to earn a significantly higher total compensation than female executives in a male-dominated industry (other things being equal):

$$\ln (\text{salary}_{it}) \ln \text{rank} 1 + 2 = \beta_0 + \beta_1 \text{female}_{it} + \beta_2 \text{age}_{it} + \beta_3 \text{age}_{it}^2 + \beta_4 \text{performance}_{it-1} + \beta_5 \text{company}_{it} + \beta_6 \text{year}_{it} + \beta_7 \text{job function}_{it} + + \beta_8 \text{job location}_{it} + \mu_{it}$$
(2)

The counterfactual semiparametric decomposition following Melly (2005) has been used based on this quantile regression model. Many prior studies have employed the Blinder (1973)–Oaxaca (1973) decomposition method to measure a potential gender pay gap (e.g., Bertrand & Hallock, 2001; Card et al., 2016). The difference between the methods is that the Blinder (1973)–Oaxaca (1973) decomposes differences at the mean to the whole distribution, whereas the Melly (2005) approach performs decomposition based on quantile regression. To put it briefly, quantile regression can be interpreted as using the error distribution in the wage equation for the definition of different wage categories, that is, quantiles, instead of the observed wage differentials (Jellal et al., 2008). Quantile regressions also have some robustness properties due to quantiles' insensitivity to outliers in wages (Fitzenberger & Wunderlich, 2002). Thus, a quantile regression framework is more appropriate to study wage differentials. In addition, quantile regression allows the researcher to focus on specific parts of the distribution, which is the conditional distribution of the dependent variable, and to estimate the marginal effect of an independent variable on the dependent variable at various points in the distribution (Jellal et al., 2008). This argument was important for our analysis since its focus is on the glass ceiling effect, that is, the upper part of the wage distribution. In the forthcoming description of the analysis, we concentrate on the quantiles from 0.7 onwards, reflecting the upper wage distribution and, hence, the executive circle. Other glass ceiling studies have used a similar approximation (e.g., Jellal et al., 2008).

First, we present the results of a random-effects regression for the executive ranks 1 and 2 to evaluate how being female is associated with one's total salary. The random-effects regression model has been constructed in the same manner as model (2). It includes all relevant variables and controls.

Evidently, Table 3 indicates that being female is associated with a decrease in one's total salary. Specifically, being female is associated with a 6.8% lower total wage than being male, other things being equal. This result is highly significant at the 1% level. In contrast to the female premium for internal promotions, being female is associated with a decrease in total salary. Interestingly, time-lagged performance is a statistically insignificant indicator of one's total salary size. Age and age² show opposite patterns than they do regarding the probability of becoming promoted. Age and age² are both highly significant at the 1% level. This relationship has the typical inverted u-shape form that underlies a wage curve per definition. Generally, it accounts for the fact that growing older is initially linked to a rise in one's salary. However, in this case, after the age threshold of 52 years, there are decreasing returns of scale to age.

In order to decompose the potential wage gap between women and men, we have employed the counterfactual quantile decomposition method, following Melly (2005), for the different wage quantiles. The decomposition procedure can "redecompose" the distributional difference between females' and males' total salaries by explicitly estimating the transformation of each actual total salary observation in the group of females into a counterfactual observation (Fortin et al., 2011). The counterfactual distribution has been estimated using the conditional distribution of the dependent variable total salary given the independent variables in the sample with group = 0 (males)

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TABLE 5 Random-enects generalized least squares regression mod	TABLE	3	Random-effects generalized least squa	res regression mode
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Salary	(1)	(2)	(3)
Female	-0.0785***	-0.0683***	-0.0684***
	0.0144	0.0145	0.0145
Age		0.0444***	0.0442***
		0.0082	0.0082
Age ²		-0.0004***	-0.0004***
		0	0
Individual performance			0.0008
			0.0049
Constant	11.3363	10.206	10.2106
	0.0206	0.202	0.2015
Observations	2379	2379	2379
R ²	0.6485	0.6555	0.6555

Note: Table 3 reports the coefficients for the random-effects generalized least squares regression model with salary as the dependent variable. The main covariates were added to the estimation gradually; column (1) entails only *female*, column (2) *female*, *age*, and *age*², and column (3) the full model with *female*, *age*, *age*², and *individual performance*. Robust standard errors are included (in italics). Estimations included job function, job location, company, and year controls. *p < 0.10, **p < 0.05, ***p < 0.01.

and the independent variable distribution with group = 1 (females). The reference group contains men, while the counterfactual group consists of women.

For ease of interpretation, Figure 1 illustrates the effects over the quantiles 0.7–0.9. A quantile effect depicts the difference of quantile functions at two different treatment levels with causal interpretation under standard assumptions (Chernozhukov et al., 2013). Figure 1 shows the total difference between females' and males' salaries. It furthermore indicates how much of this difference can be attributed to the characteristics effect (female-male differences in characteristics) and the coefficients effect (female-male differences in the remuneration of these characteristics). Characteristics are all salary determining variables other than gender, that is, age, individual performance, job function, job location, and company. The coefficients effect can be interpreted as a female or male premium when the same characteristics of the two groups are evaluated and remunerated differently.

Moving beyond the mean and concentrating on the salary quantiles from 0.7 onwards, Figure 1 shows a persistent total difference between females' and males' total salary in favor of men. However, it consistently declines over percentiles 0.7, 0.8, and 0.9. While the total salary for men is 26.8% above that of women for the 0.7 salary quantile, this difference decreases to 25.1% for the 0.8 quantile and 21.7% for the 0.9 quantile. Thus, the higher the hierarchy, the smaller the total salary difference between female and male executives. More than half of the total difference is driven by the characteristics effect. Thus, for the 0.7 salary quantile, roughly 64.5% of the total difference between females' and males' salaries is attributed to the fact that men possess more favorable characteristics. In contrast, for the 0.8 quantile, the proportion explained by the characteristics effect amounts to 68.1% and increases further to 71.1% for the 0.9 quantile. Thus, the higher the hierarchy, the larger the proportion of the female–male salary difference explained by the characteristics effect. For the quantiles from 0.7 onwards, it is evident that this curve declines. For the 0.7 quantile, the coefficients effect is 9.5%, for the 0.8 quantile, it falls to 8%, and for the 0.9 quantile, it decreases to 6.2%. The latter value is the lowest for all quantiles, taking the lower and medium quantiles into account.⁵ However, a reasonable proportion of the coefficients effect persists.

In sum, the analysis of the *pay gap effect* confirms that men tend to earn more in total salary than women. In decomposing this wage premium for men for the different quantiles, we found that more than 60% of this wage differential can be explained because men exhibited more preferable characteristics. The higher the wage hierarchy,



FIGURE 1 Quantile decomposition of executive salary by gender. *Notes*: Figure 1 illustrates the quantile effects for the total difference between females' and males' salaries consisting of the effect of characteristics and the effect of coefficients over the salary quantiles 0.7–0.9. Male executives form the reference group, while female executives constitute the counterfactual group. A total of 100 regressions were estimated, and the variance was estimated by bootstrapping the results 100 times [Colour figure can be viewed at wileyonlinelibrary.com]

the proportion of the characteristics effect increases. However, a substantial proportion of the coefficients effect remains, indicating that the same characteristics of men and women are remunerated differently, that is, more favorably for male executives than for female executives. For the 0.9 quantile, the proportion of the coefficients effect is the smallest over all wage quantiles. Thus, our analysis indicates that men tend to earn more in total wages than women and that the difference can only be partly explained by the different set of wage determining characteristics. Hence, we confirm our second hypothesis: *Male executives tend to earn a significantly higher total compensation than female executives in a male-dominated industry (other things being equal).*

6 | DISCUSSION AND CONCLUSION

6.1 | Discussion and implication of results

In this paper, we provide empirical evidence of the glass ceiling effect in a male-dominated industry by focusing our analysis on both of its dimensions, the *invisible barrier* and the *pay gap effect*.

Our research shows that, in these circumstances, women are more likely to be promoted to the top executive hierarchies than men in a male-dominated industry. Specifically, we found a 5.3% point higher probability for a woman to be promoted to the executive hierarchies (as opposed to a man). Yet, the executive sphere is still clearly male dominated.

Regarding the female-male wage differential, women still receive a lower total salary than men. Specifically, the pay differential between men and women for the executive sphere ranges between 21.7% and 26.8%. More than half of the total difference is driven by men's more favorable characteristics. These characteristics include age, company, and job-related characteristics. The coefficients effect alluding to gender pay inequality constitutes between 6.2% and 9.5%. However, the higher the executive hierarchy, the less pronounced is the wage differential between women and men.

One plausible explanation for the promotion advantage of women might be a political regulation on female quotas. In Britain, the so-called "30% Club" was introduced in 2010 and is a voluntary directive. The club's goal is to

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ensure that at least 30% of board members are women in the Financial Times Stock Exchange 100 index top company boards (Gordon, 2015). Among the 30% Club members are also companies of the analyzed data set. Their dedicated membership should have some signaling power for the entire sector.

A possibility is that the *pay gap effect* is a consequence of women's poor negotiation skills, as posited by the theory explaining gender differences in noncognitive skills and social norms (e.g., Stuhlmacher & Walters, 1999). Our findings could also reflect women's preferences for flexible working arrangements: To reconcile family and employment responsibilities, women more commonly request flexible working conditions, such as flextime and working from home (Teasdale, 2013). These deviations from standard employment relationships are often linked to lower wages (e.g., Ferber & Waldfogel, 1998; Kalleberg, 2000).

Lastly, the coefficients effect reflects gender pay discrimination: A substantial part of the pay differential, 6.0–9.5%, can be attributed to the fact that the same characteristics shared by women and men are evaluated differently. Hence, this finding is gender biased.

The coefficients effect diminishes the higher one who climbs up the executive ladder, suggesting that the higher the hierarchy, the less pay discrimination prevails. One plausible explanation for this finding could be that women who made it beyond the very glass ceiling in this gender-imbalanced industry might be similar to men regarding their attitudes and behavioral dispositions. Besides, there is a self-selection effect for women who rise against significant odds above the very glass ceiling. This combination, self-selection and attitudes similar to men's, might manifest itself in executive women's high bargaining power, which can be linked to the declining gender pay disparity for the very high hierarchies. Azmat & Ferrers' (2017) study on gender performance gaps of lawyers supports this reasoning: They found that noncognitive traits and preference of female lawyers who become high-status partners do not significantly differ from those of male partners. However, there is a significant difference in these attributes between female and male lawyers.

Prior studies that have scrutinized the *invisible barrier effect* confirm our results to a large extent. For example, Gayle et al. (2012) found a probability of 27% for a woman to become promoted using executive data across industries. In comparison, we found a higher probability of 5.3% point for a woman to be promoted (as opposed to a man) to the executive hierarchies using data of a male-dominated industry. Next, our analysis reveals a gender bias in total salary favoring men. Thereby, our analysis contradicts other studies that have found an insignificant wage gap or even a wage premium for female executives (e.g., Bertrand & Hallock, 2001; Gregory-Smith et al., 2014). Our study is in line with prior research confirming the *pay gap effect* (e.g., Bell, 2005).

In addition to the previously described individual results, our study also provides a basis for overall implications. Essentially, the findings suggest that the glass ceiling in this male-dominated industry has started to crack: Consistent with the critical actor theory, women who are more likely to be promoted to the executive echelons will initiate positive changes for other women (Dahlerup, 1988). With some delay, having more women on the top, they might take the role of critical actors and improve working conditions, including the pay bias found in our data. Other empirical studies also reflect this (e.g., Cardoso & Winter-Ebmer, 2010; Cohen & Huffman, 2007; Stojmenovska, 2019). Moreover, women's presence as leaders is linked to less gender segregation since their access to executive power is crucial to transform the gendered organization (Cotter et al., 1997; Ely, 1995; Stainback et al., 2016). Hence, they are the key to "disrupt the gender order" (Martin, 2003). Our analysis suggests that this promising virtuous cycle has been initiated. As a final comment on this study's implications, our analysis raises hope for women and feminists worldwide: Our work suggests that the executive sphere in a male-dominated industry is about to change. Thus, if the last bastion of male dominance falls, we could soon live in a world characterized by more gender equality at work.

Our findings have various implications for policy and decision-makers. First of all, given the low female ratio in this industry, it makes sense not only to rely on quota but to start even earlier. Precisely, initiatives should be set up to attract more female students for an education in male-dominated disciplines with a management focus.

While the increased promotion probability of women might be a consequence of specific political regulations, such as the 30% Club, we cannot infer a causal relationship since our data sample covers a timeframe after the introduction and not before. However, given our findings, one might suggest that those policies affect corporate behavior. While our analysis suggests that female leaders will take the role of critical actors and correct the gender pay bias "by itself", another political regulation could expedite this pay convergence. Britain introduced a gender pay gap law in 2017, forcing companies with more than 250 employees to provide comprehensive data about their pay policy regarding the remuneration of women and men (Topping, 2017). Based on our findings, such regulation could represent another pillar to combat pay inequality besides female leaders.

Finally, female leaders can become critical actors if the working environment is supportive. Sexist organizational cultures with low gender identification might be detrimental to this process. Hence, corporate leadership tutorials on gender-specific communication styles might help to gain understanding and break open an encrusted, masculine working culture.

6.2 | Limitations and future research

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Naturally, our study is subject to some limitations: A major drawback is that we do not have any information on the exit rates of executives. Exit rates have been analyzed by Gayle et al. (2012) and appear to be meaningful for constructing mobility patterns. In addition, prior research has found that women are more likely than men to drop out of male-dominated fields (Frome et al., 2006). Though one of this study's main features is the availability of an individual's performance measure, it depends on the subjective evaluation. Although some human capital variables might not play a huge role in the sphere of executives, further details, for example, on family status, would have been useful. Unfortunately, these variables were not available in the data set. Lastly, since the analyzed data set does not include the companies' whole personnel, it is not fully representative. Thus, the results and conclusions of this paper should be taken with caution.

For future research, a qualitative follow-up study would be meaningful to contextualize the industry, the types of jobs women perform, and the roles women assume in this setting. By doing so, one could explore if women in this industry are not only inhibited by a glass ceiling above them, but also by glass walls that surround them. Also, glass ceiling studies of other industries and the comparison to this analysis's results would help to gain an understanding of the phenomenon.

ACKNOWLEDGMENT

Open Access funding enabled and organized by Projekt DEAL.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

ENDNOTES

¹ The term "A-levels" refers to the higher education entrance qualification in many European countries.

- ² For a comprehensive discussion on the critical actor theory see Dahlerup (1988); Childs and Krook (2006); or Childs and Krook (2009).
- ³ The term is also applied to describe blockades from managerial attainment for other minorities besides women (e.g., Maume, 2004).
- ⁴ In 2003, Norway was among the first countries to launch an initially voluntary target of 40% for female representation on the boards of all listed companies by 2005. Some countries, such as Finland and Spain have followed Norway's example, while others, such as Britain and the Netherlands have implemented a less directive approach (Seierstad & Huse, 2017).
- ⁵ Figure 1 only displays the quantile effects for 0.7–0.9 representing the executive sphere.

REFERENCES

- Acker, Joan. 1990. "Hierarchies, Jobs, Bodies: A Theory of Gendered Organizations." Gender & Society 4(2): 139–58. https:// doi.org/10.1177/089124390004002002.
- Acker, Joan. 2006. "Inequality Regimes: Gender, Class, and Race in Organizations." Gender & Society 20(4): 441–64. https:// doi.org/10.1177/0891243206289499.
- Albrecht, James, Anders Björklund, and Susan Vroman. 2003. "Is There a Glass Ceiling in Sweden?" Journal of Labor Economics 21(1): 145–77. https://doi.org/10.1086/344126.
- Albrecht, James, Aico Van Vuuren, and Susan Vroman. 2009. "Counterfactual Distributions with Sample Selection Adjustments: Econometric Theory and an Application to the Netherlands." *Labour Economics* 16(4): 383–96. https://doi. org/10.1016/j.labeco.2009.01.002.
- Altman, Yochanan, Ruth Simpson, Yehuda Baruch, and Ronald J. Burke. 2005. "Reframing the 'glass Ceiling' Debate." In Supporting Women's Career Advancement: Challenges and Opportunities, edited by R. J. Burke and M. C. Mattis, 58–81. Cheltenham: Edward Elgar.
- Arrow, Kenneth J. 1971. Some Models of Racial Discrimination in the Labor Market. The Rand Corporation.
- Arulampalam, Wiji, Alison L. Booth, and Mark L. Bryan. 2007. "Is There a Glass Ceiling over Europe? Exploring the Gender Pay Gap across the Wage Distribution." *Industrial and Labor Relations Review* 60(2): 163–86. https://doi. org/10.1177/001979390706000201.
- Azmat, Ghazala, and Rosa Ferrer. 2017. "Gender Gaps in Performance: Evidence from Young Lawyers." Journal of Political Economy 125(5): 1306–355. https://doi.org/10.1086/693686.
- Baron, James N. 1991. "Organizational Evidence of Ascription in Labor Markets." In New Approaches to Economic and Social Analyses of Discrimination, edited by R. R. Cornwall and P. V. Wunnava, 113–43. New York, NY: Praeger.
- Baxter, Janeen, and Erik Olin Wright. 2000. "The Glass Ceiling Hypothesis: A Comparative Study of the United States, Sweden, and Australia." *Gender & Society* 14(2): 275–94. https://doi.org/10.1177/089124300014002004.
- Becker, Gary S. 1971. The Economics of Discrimination. 1st ed. University of Chicago Press.
- Bell, Linda A. 2005. Women-led Firms and the Gender Gap in Top Executive Jobs (IZA Discussion Paper, No. 1689).
- Bendl, Regine, and Angelika Schmidt. 2010. "From 'Glass Ceilings' to 'Firewalls' Different Metaphors for Describing Discrimination." Gender, Work and Organization 17(5): 612–34. https://doi.org/10.1111/j.1468-0432.2010.00520.x.
- Bertrand, Marianne, and Kevin F. Hallock. 2001. "The Gender Gap in Top Corporate Jobs." *Industrial and Labor Relations Review* 55(1): 3–21. https://doi.org/10.1177/001979390105500101.
- Blinder, Alan S. 1973. "Wage Discrimination: Reduced Form and Structural Estimates." Journal of Human Resources 8(4): 436–55. https://doi.org/10.2307/144855.
- Bonjour, Dorothe, and Michael Gerfin. 2001. "The Unequal Distribution of Unequal Pay An Empirical Analysis of the Gender Pay Gap in Switzerland." *Empirical Economics* 26(2): 407–27. https://doi.org/10.1007/s001810000063.
- Booth, Alison L. 2009. "Gender and Competition." Labour Economics 16(6): 599-606. https://doi.org/10.1016/j. labeco.2009.08.002.
- Braddock, Jomills Henry, and James M. McPartland. 1987. "How Minorities Continue to Be Excluded from Equal Employment Opportunities: Research on Labor Market and Institutional Barriers." *Journal of Social Issues* 43(1): 5–39. https://doi. org/10.1111/j.1540-4560.1987.tb02329.x.
- Card, David, Ana Rute Cardoso, and Patrick Kline. 2016. "Bargaining, Sorting, and the Gender Pay Gap: Quantifying the Impact of Firms on the Relative Pay of Women." *Quarterly Journal of Economics* 131(2): 633–86. https://doi.org/10.1093/ qje/qjv038.
- Cardoso, Ana Rute, and Rudolf Winter-Ebmer. 2010. "Female-led Firms and Gender Wage Policies." Industrial and Labor Relations Review 64(1): 143–63. https://doi.org/10.1177/001979391006400107.
- Catalyst. 2020. "Women on Corporate Boards Globally." *Catalyst*. http://www.catalyst.org/knowledge/women-corporateboards-globally.
- Chao, Georgia T. 1997. "Mentoring Phases and Outcomes." Journal of Vocational Behavior 51(1): 15–28. https://doi. org/10.1006/jvbe.1997.1591.
- Chernozhukov, Victor, Iván Fernández-Val, and Blaise Melly. 2013. "Inference on Counterfactual Distributions." Econometrica 81(6): 2205–268. https://doi.org/10.3982/ECTA10582.
- Childs, Sarah, and Mona Lena Krook. 2006. "Should Feminists Give up on Critical Mass? A Contingent Yes." *Politics and Gender* 2(4): 522–30. https://doi.org/10.1017/S1743923X06251146.
- Childs, Sarah, and Mona Lena Krook. 2009. "Analysing Women's Substantive Representation: From Critical Mass to Critical Actors." Government and Opposition 44(2): 125–45. https://doi.org/10.1111/j.1477-7053.2009.01279.x.
- Cohen, Lisa E., Joseph P. Broschak, and Heather A. Haveman. 1998. "And Then There Were More? The Effect of Organizational Sex Composition on the Hiring and Promotion of Managers." *American Sociological Review* 63(5): 711–27. https:// doi.org/10.2307/2657335.
- Cohen, Philip N., and Matt L. Huffman. 2007. "Working for the Woman? Female Managers and the Gender Wage Gap." American Sociological Review 72(5): 681–704. https://doi.org/10.1177/000312240707200502.

- Cortina, Lilia M. 2008. "Unseen Injustice: Incivility as Modern Discrimination in Organizations." Academy of Management Review 33(1): 55–75. https://doi.org/10.5465/amr.2008.27745097.
- Cotter, David A., JoAnn DeFiore, Joan M. Hermsen, Brenda Marsteller Kowalewski, and Reeve Vanneman. 1997. "All Women Benefit: The Macro-Level Effect of Occupational Segregation on Gender Earnings Equality." American Sociological Review 62(5): 714–34. https://doi.org/10.2307/2657356.
- Cotter, David A., Joan M. Hermsen, Seth Ovadia, and Reeve Vanneman. 2001. "The Glass Ceiling Effect." Social Forces 80(2): 655–81. https://doi.org/10.1353/sof.2001.0091.
- Dahlerup, Drude. 1988. "From a Small to a Large Minority: Women in Scandinavian Politics." *Scandinavian Political Studies* 11(4): 275–98. https://doi.org/10.1111/j.1467-9477.1988.tb00372.x.
- Davidson, Marilyn J., and Cary L. Cooper. 1992. Shattering the Glass Ceiling: The Women Manager. London: Paul Chapman Publishing.
- De la Rica, Sara, Juan J. Dolado, and Vanesa Llorens. 2008. "Ceilings or Floors? Gender Pay Gaps by Education in Spain." Journal of Population Economics 21(3): 751–76. https://doi.org/10.1007/s00148-006-0128-1.
- Dohmen, Thomas, and Armin Falk. 2011. "Performance Pay and Multidimensional Sorting: Productivity, Preferences, and Gender." *The American Economic Review* 101(2): 556–90. https://doi.org/10.1257/aer.101.2.556.
- Dohmen, Thomas, Armin Falk, David Huffman, Uwe Sunde, Jürgen Schupp, and Gert G. Wagner. 2011. "Individual Risk Attitudes: Measurement, Determinants, and Behavioral Consequences." *Journal of the European Economic Association* 9(3): 522–50. https://doi.org/10.1111/j.1542-4774.2011.01015.x.
- Dreher, George F. 2003. "Breaking the Glass Ceiling: The Effects of Sex Ratios and Work-Life Programs on Female Leadership at the Top." *Human Relations* 56(5): 541–62. https://doi.org/10.1177/0018726703056005002.
- Ely, Robin J. 1995. "The Power in Demography: Women's Social Constructions of Gender Identity at Work." Academy of Management Journal 38(3): 589–634. https://doi.org/10.2307/256740.
- Federal Glass Ceiling Commission. 1995. Good for Business: Making Full Use of the Nation's Human Capital: The Environmental Scan; A Fact-Finding Report of the Federal Glass Ceiling Commission. Washington, D.C.: Government Printing Office.
- Ferber, Marianne A., and Jane Waldfogel. 1998. "The Long-Term Consequences of Nontraditional Employment." Monthly Labor Review 21: 3.
- Filippin, Antonio, and Andrea Ichino. 2005. "Gender Pay Gap in Expectations and Realizations." *Labour Economics* 12(1): 125–45. https://doi.org/10.1016/j.labeco.2004.03.004.
- Fitzenberger, Bernd, and Gaby Wunderlich. 2002. "Gender Wage Differences in West Germany: A Cohort Analysis." *German Economic Review* 3(4): 379–414. https://doi.org/10.1111/1468-0475.00065.
- Fortin, Nicole, Thomas Lemieux, and Sergio Firpo. 2011. "Decomposition Methods in Economics." In Handbook of Labor Economics, 1–102. North Holland.
- Frick, Bernd, and Michael Maihaus. 2016. "The Structure and Determinants of Expected and Actual Starting Salaries of Higher Education Students in Germany: Identical or Different?" *Education Economics* 24(4): 374–92. https://doi.org/10 .1080/09645292.2015.1110115.
- Frome, Pamela M., Corinne J. Alfeld, Jacquelynne S. Eccles, and Bonnie L. Barber. 2006. "Why Don't They Want a Male-Dominated Job? An Investigation of Young Women Who Changed Their Occupational Aspirations." *Educational Research and Evaluation* 12(4): 359–72. https://doi.org/10.1080/13803610600765786.
- Gayle, George-Levi, Limor Golan, and Robert A. Miller. 2012. "Gender Differences in Executive Compensation and Job Mobility." Journal of Labor Economics 30(4): 829–72. https://doi.org/10.1086/666615.
- Gerdes, Christer, and Patrik Gränsmark. 2010. "Strategic Behavior across Gender: A Comparison of Female and Male Expert Chess Players." *Labour Economics* 17(5): 766–75. https://doi.org/10.1016/j.labeco.2010.04.013.
- Gerhart, Barry. 1990. "Gender Differences in Current and Starting Salaries: The Role of Performance, College Major, and Job Title." Industrial and Labor Relations Review 43(4): 418–33. https://doi.org/10.1177/001979399004300406.
- Germain, Marie-Line, Mary Jean Ronan Herzog, and Penny Rafferty Hamilton. 2012. "Women Employed in Male-Dominated Industries: Lessons Learned from Female Aircraft Pilots, Pilots-In-Training and Mixed-Gender Flight Instructors." *Human Resource Development International* 15(4): 435–53. https://doi.org/10.1080/13678868.2012.707528.
- Gneezy, Uri, Muriel Niederle, and Aldo Rustichini. 2003. "Performance in Competitive Environments: Gender Differences." Quarterly Journal of Economics 118(3): 1049–074. https://doi.org/10.1162/00335530360698496.
- Gordon, Sarah. 2015. "The 30% Club: How Women Have Taken on the Old Boys' Network." *Financial Times*. https://www.ft.com/content/43177e48-8eaf-11e5-8be4-3506bf20cc2b.
- Gorman, Elizabeth H., and Julie A. Kmec. 2009. "Hierarchical Rank and Women's Organizational Mobility: Glass Ceilings in Corporate Law Firms." American Journal of Sociology 114(5): 1428–474. https://doi.org/10.1086/595950.
- Gregory-Smith, Ian, Brian G. M. Main, and Charles A. O'Reilly, III. 2014. "Appointments, Pay and Performance in UK Boardrooms by Gender." The Economic Journal 124(574): 109–28. https://doi.org/10.1111/ecoj.12102.
- Gupta, Nabanita Datta, and Nina Smith. 2002. "Children and Career Interruptions: The Family Gap in Denmark." *Economica* 69(276): 609–29. https://doi.org/10.1111/1468-0335.00303.

KRÄFT

- Gupta, Nabanita Datta, Ronald L. Oaxaca, and Nina Smith. 2006. "Swimming Upstream, Floating Downstream: Comparing Women's Relative Wage Progress in the United States and Denmark." *Industrial and Labor Relations Review* 59(2): 243–66. https://doi.org/10.1177/001979390605900204.
- Hymowitz, Carol, and Timothy D. Schellhardt. 1986. "The Glass Ceiling: Why Women Can't Seem to Break the Invisible Barrier That Blocks Them from the Top Jobs." *The Wall Street Journal*.
- Jacobs, Jerry A. 1992. "Women's Entry into Management: Trends in Earnings, Authority and Values Among Salaried Managers." Administrative Science Quarterly 37(2): 282–301. https://doi.org/10.2307/2393225.
- Jellal, Mohamed, Christophe J. Nordman, and François-Charles Wolff. 2008. "Evidence on the Glass Ceiling Effect in France Using Matched Worker-Firm Data." Applied Economics 40(24): 3233–250. https://doi.org/10.1080/00036840600994070.
- Jung, Hanna, and Joonmo Cho. 2020. "Gender Inequality of Job Security: Veiling Glass Ceiling in Korea." Journal of the Asia Pacific Economy 25(1): 79–98. https://doi.org/10.1080/13547860.2019.1631528.
- Kalleberg, Arne L. 2000. "Nonstandard Employment Relations: Part-Time, Temporary and Contract Work." Annual Review of Sociology 26(1): 341–65. https://doi.org/10.1146/annurev.soc.26.1.341.
- Kanter, Rosabeth Moss. 1977. "Some Effects of Proportions on Group Life: Skewed Sex Ratios and Responses to Token Women." American Journal of Sociology 82(5): 965–90. https://doi.org/10.1086/226425.
- Kee, Hiau Joo. 2006. "Glass Ceiling or Sticky Floor? Exploring the Australian Gender Pay Gap." The Economic Record 82(259): 408–27. https://doi.org/10.1111/j.1475-4932.2006.00356.x.
- Keith, Kristen, and Abagail McWilliams. 1999. "The Returns to Mobility and Job Search by Gender." Industrial and Labor Relations Review 52(3): 460–77. https://doi.org/10.1177/001979399905200306.
- Kolster, Renze, and Frans Kaiser. 2015. Study Success in Higher Education: Male versus Female Students (CHEPS working paper, 2015(7)).
- Marini, Margaret Mooney. 1989. "Sex Differences in Earnings in the United States." Annual Review of Sociology 15(1): 343–80. https://doi.org/10.1146/annurev.so.15.080189.002015.
- Martin, Patricia Yancey. 2003. ""Said and Done" versus "Saying and Doing": Gendering Practices, Practicing Gender at Work." Gender & Society 17(3): 342–66. https://doi.org/10.1177/0891243203017003002.
- Maume, David J. 2004. "Is the Glass Ceiling a Unique Form of Inequality? Evidence from a Random-Effects Model of Managerial Attainment." Work and Occupations 31(2): 250–74. https://doi.org/10.1177/0730888404263908.
- Melly, Blaise. 2005. "Decomposition of Differences in Distribution Using Quantile Regression." Labour Economics 12(4): 577–90. https://doi.org/10.1016/j.labeco.2005.05.006.
- Meyerson, Debra E., and Joyce K. Fletcher. 2000. "A Modest Manifesto for Shattering the Glass Ceiling." *Harvard Business Review* 78(1): 127–36.
- Miller, Paul W. 2009. "The Gender Pay Gap in the US: Does Sector Make a Difference?" Journal of Labor Research 30(1): 52-74. https://doi.org/10.1007/s12122-008-9050-5.
- Morgan, Laurie A. 1998. "Glass-ceiling Effect or Cohort Effect? A Longitudinal Study of the Gender Earnings Gap for Engineers, 1982 to 1989." American Sociological Review 63(4): 479–83. https://doi.org/10.2307/2657263.
- Morrison, Ann M., Randall P. White, and Ellen Van Velsor. 1987. Breaking the Glass Ceiling: Can Women Reach the Top of America's Largest Corporations? Reading, MA: Addison-Wesley.
- Muñoz-Bullón, Fernando. 2010. "Gender-compensation Differences Among High-level Executives in the United States." Industrial Relations: A Journal of Economy and Society 49(3): 346–70. https://doi.org/10.1111/j.1468-232X.2010.00604.x.
- Niederle, Muriel, and Lise Vesterlund. 2007. "Do women Shy Away from Competition? Do Men Compete Too Much?" Quarterly Journal of Economics 122(3): 1067–101. https://doi.org/10.1162/qjec.122.3.1067.
- Nordman, Christophe J., and François-Charles Wolff. 2009. "Is There a Glass Ceiling in Morocco? Evidence from Matched Worker–Firm Data." *Journal of African Economies* 18(4): 592–633. https://doi.org/10.1093/jae/ejn029.
- Oaxaca, Ronald. 1973. "Male-female Wage Differentials in Urban Labor Markets." International Economic Review 14(3): 693–709. https://doi.org/10.2307/2525981.
- Olgiati, Etta, and Gillian Shapiro. 2002. Promoting Gender Equality in the Workplace. Luxembourg: Office for Official Publications of the European Communities. http://www.eurofound.europa.eu/pubdocs/2001/61/en/1/ef0161en.pdf.
- Phelps, Edmund S. 1972. "The Statistical Theory of Racism and Sexism." The American Economic Review 62(4): 659–61.
- Reskin, Barbara F. 2000. "The Proximate Causes of Employment Discrimination." Contemporary Sociology 29(2): 319–28. https://doi.org/10.2307/2654387.
- Ridgeway, Cecilia L. 1997. "Interaction and the Conservation of Gender Inequality: Considering Employment." American Sociological Review 62(2): 218–35. https://doi.org/10.2307/2657301.
- Ridgeway, Cecilia L. 2001. "The Emergence of Status Beliefs: From Structural Inequality to Legitimizing Ideology." In The Psychology of Legitimacy: Emerging Perspectives on Ideology, Justice, and Intergroup Relations, edited by J. T. Jost and B. Major, 257–77. Cambridge University Press.
- Ridgeway, Cecilia L., and England Paula. 2007. "Sociological Approaches to Sex Discrimination in Employment." In Sex Discrimination in the Workplace, edited by F. J. Crosby, M. S. Stockdale and S. Ann Ropp. Blackwell.

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- Seierstad, Cathrine, and Morten Huse. 2017. "Gender Quotas on Corporate Boards in Norway: Ten Years Later and Lessons Learned." In *Gender Diversity in the Boardroom*, 11–45. Springer International Publishing.
- Stainback, Kevin, Sibyl Kleiner, and Sheryl Skaggs. 2016. "Women in Power: Undoing or Redoing the Gendered Organization?" Gender & Society 30(1): 109–35. https://doi.org/10.1177/0891243215602906.
- Stojmenovska, Dragana. 2019. "Management Gender Composition and the Gender Pay Gap: Evidence from British Panel Data." *Gender, Work and Organization* 26(5): 738–64. https://doi.org/10.1111/gwao.12264.
- Stroh, Linda K., Christine L. Langlands, Patricia A. Simpson, Margaret S. Stockdale, and Faye J. Crosby. 2004. "Shattering the Glass Ceiling in the New Millennium." In *The Psychology and Management of Workplace Diversity*, edited by M. S. Stockdale and F. J. Crosby, 147–67. Malden, MA: Blackwell.
- Stuhlmacher, Alice F., and Amy E. Walters. 1999. "Gender Differences in Negotiation Outcome: A Meta-analysis." *Personnel Psychology* 52(3): 653–77. https://doi.org/10.1111/j.1744-6570.1999.tb00175.x.
- Taylor, Catherine J. 2010. "Occupational Sex Composition and the Gendered Availability of Workplace Support." Gender & Society 24(2): 189–212. https://doi.org/10.1177/0891243209359912.
- Teasdale, Nina. 2013. "Fragmented Sisters? The Implications of Flexible Working Policies for Professional Women's Workplace Relationships." Gender, Work and Organization 20(4): 397–412. https://doi.org/10.1111/j.1468-0432.2012.00590.x.
- Topping, Alexandra. 2017. "Gender Pay Gap Law Could Have Significant Impact, Say Experts." *The Guardian*. https://www. theguardian.com/society/2017/apr/06/gender-pay-gap-law-could-have-significant-impact-say-experts.
- Valian, Virginia. 2004. "Beyond Gender Schemas: Improving the Advancement of Women in Academia." National Women's Studies Association Journal 16(1): 207–20. https://doi.org/10.2979/nws.2004.16.1.207.
- Walker, Nefertiti A., and Trevor Bopp. 2011. "The Underrepresentation of Women in the Male-Dominated Sport Workplace: Perspectives of Female Coaches." *Journal of Workplace Rights* 15(1): 47–64. https://doi.org/10.2190/wr.15.1.d.
- Watts, Jacqueline H. 2009. "Leaders of Men: Women 'managing' in Construction." Work, Employment & Society 23(3): 512–30. https://doi.org/10.1177/0950017009337074.
- Wright, Erik Olin, Janeen Baxter, and Gunn Elisabeth Birkelund. 1995. "The Gender Gap in Workplace Authority: A Cross-National Study." American Sociological Review 60(3): 407–35. https://doi.org/10.2307/2096422.

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How to cite this article: Kräft, Charlotte. 2022. "Equal Pay behind the "Glass Door"? The Gender Gap in Upper Management in a Male-Dominated Industry." *Gender, Work & Organization* 29(6): 1910–1926. https://doi.org/10.1111/gwao.12890.