Linnæus University
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Bachelor Thesis

Is There A Glass Ceiling In Japan?
Occupational Segregation and Sex Differences in Managerial Promotions in Japan

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Abstract

This paper analyses the difference probability in holding managerial positions between men and women in Japan as the glass ceiling effect. In addition, we analyses whether the difference is affected by gender composition within the workplaces. We estimate two specifications of an ordered logit model on Japanese General Social Surveys (JGSS) as well as Japanese yearbook of labor statistics in the year 2010. The results indicate that there is different probability of holding managerial status that women have lower probability of holding managerial positions irrespective of management level comparing to men. However, we can observe that the differentials are decreasing as the managerial positions move up into higher managerial hierarchies. This finding indicates that women have higher chance to hold higher positions. Thus, it is contradict to our hypothesis. In addition, the result suggests that the gender composition also matter in probability of holding managerial status between male and female in Japan. We inspect that the difference probability in holding managerial status between genders is greater in female dominated occupation. This finding shows the effect of glass ceiling that occurs when women work in female dominated occupation as it follows the theory.

Keywords

Glass Ceilings, Occupational Sex Segregation, Promotions, Gender

Acknowledgements

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Introduction

Women and men are obviously had an inequality between gender especially on wage gap. Wage gap is one of the most concern by economists. It generally found in every country but the degree of discrimination can vary depends on each country. Base on data suggested by the Organisation for Economic Co-operation and Development (OECD), in 2010[1], OECD average has estimated gender wage gap to be an average of approximately 15.4% with most of the high equality countries having the percentage wage gap below the global average with Norway as the lowest income gap at 8.1%, Denmark at 11.8% and Sweden with 14.3%. Furthermore, our study also shows that some of the developed, wage gap within the country still higher than the average, United States is having 18.8% of wage gap, United Kingdom with 19.2% and Japan with 28.7%.

Several studies also show that there are positive correlation between the wage gap and level of skill required for job. For example, using Swedish data collected in 1998, Albrecht et al. (2003) show that gender wage gap is increasing in wage distribution and wage gap growing faster especially on the top positions. Further, using the European Community Household Panel data set. Arulampalam et al. (2004) found that gender wage gap is not only larger as the job position progressed but exhibit the same income gap rising for those of the lower position in the long run. This is referred to as the glass ceiling effect. Morrison, White, and Van Velsor (1987) refer to the glass ceiling effect as an invisible barrier that blocks women's upward mobility and that women can thus only advance up to a certain level. Even though women try to work hard to get in to higher position but the invisible shield always block them.

The glass ceiling effects suggest that women, compared to men, have difficulties in reaching managerial positions. Baxter and Wright (2000) found that the glass ceiling effect occur in the United States, Sweden, and Australia, especially in Sweden and Australia. The effect is much stronger among middle manager position more than top manager positions. Maume (1999) also found that women in the United States face difficulties to attain management position compare to men. Schein (1973,1975) found that male and female managers perceived that the characteristics associated with managerial achievement were more likely to be held by men than by women. With these indicated perception, it creates barrier in managerial selection,

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[1] https://www.oecd.org/gender/data/genderwagegap.htm

placement, promotion, and training decision on women which lead to the formation of glass ceiling effect.

Furthermore, Maume (1999) shows that gender composition affects the signification of glass ceiling effect within the workplace. Females who work in female dominated occupations favor male workers, since males are considered as high ability. Thus, female co-workers tend to promote males to receive managerial positions. In addition, the patronizing relationship between male workers and male supervisors fosters subordinate men into managerial position than women (Hultin, 2003). Therefore, women have difficulties in reaching management position owing to gender composition.

Most of glass ceiling studies are based on European data, hardly any can found in Asia countries, especially in Japan which is never have been studied before. Japan is one of the most interesting country to focus because wage gap between the average pay of males and females in Japan has been the largest among developed countries compare to another developed country such as the United Kingdom and the United States (Koyo, 2007). Wage gap in Japan is believed to be drawn from the assumption of the glass ceiling effect. However, there has been no studies have been focus on glass ceiling. From our point of view, since there is none of any studies have been studied about glass ceiling in Japan and it is interesting to see how women can be blocked from moving to managerial position if they work in female-dominated occupations and is it the effect of glass ceiling or not. Therefore, our objective is to study this subject with two hypotheses in mind. First if there is a difference in holding a managerial position between women and men in Japan or not. Second is the difference is affected by the gender composition within the occupations or not.

Theory

Using the glass ceiling presumption, this study aims to explore differences between women and men in Japan holding managerial positions. The glass ceiling is a metaphor representing an invisible barrier blocking females from advancing upwards into higher-level positions, as women are said to have different difficulties than men in pursuing supervisory positions (Morrison et al., 1987). The glass ceiling suggests that although women are able to acquire some managerial positions, at a certain point they hit a barrier that blocks them from accessing higher-level jobs (Baxter and Wright, 2000). While it is impossible to clearly state

the cause of the glass ceiling, we may theorize that it is attributable to dynamic relationships between human capital, preference, social tradition, and discrimination.

Two possible reasons underlie the hypothesis that there is a difference between women and men in holding a managerial position, which cause women difficulty in acquiring higher-level positions. The first reason is based on the supply-side relating to the differences in human capital and cultural norms. In the framework of Becker's (1981) specialization within families, males and females are specialized by virtue of their gender into different types of occupations. For instance, due to biological differences females are better at the production and upkeep of the home while males hold a comparative advantage working in the labor market. Moreover, males and females decide the level of human capital investment according to his or her expected return. In fact, females tend to accumulate and invest less human capital in education and training due to lower expected return since they are often burdened with responsibilities in the home (Baron, 1987). Thus, these comparative advantages for men caused by biological differences and accumulated human capital nurture male workers into higher managerial positions than are afforded to females.

Social norms are also one of the factors that directly influence an individual's preference of employee, such that it plays a significant role in determining occupation choices of each gender. In Japan, women are generally taught to perform well in regards to upkeep of the home as they are not suitable in leading positions. In fact, Japanese women hold responsibility for almost all of the housework (Abe et al., 2003). With this, they are also expected to request parental leave after getting married, while male workers have the opportunity to fulfil full-time employment without foreseen leave. Thus, Japanese women are likely to segregate themselves into some specific occupations with less authority or managerial decision involved (Johnson and Stafford, 1997), e.g. low-status and low-paying jobs (Anker 1998). As evident by the high concentration of women in the small numbers of occupations, their skills are less perceived as depositories (Maume, 1999), while male's skills become scarce and more than needed in these occupations. Therefore, the ability of men are superior within the workplace such that they are more likely to be promoted into managerial position.

The second reason behind the difference between women and men holding differing managerial positions comes from demand-side discrimination, in which females are potentially prejudiced against in the labor market by both employers and employees. Within

Becker's theoretical research (1957), taste-based discrimination is a situation wherein the employer is prejudiced against a certain group of workers. For example, employers may have particular discrimination towards female workers. According to this theory we could assume if A is a group of males and B is a group of females, and if an employer discriminates against females, the wage of females (W_A) becomes $(1+d)W_A$, in which d represents the discrimination coefficient representing the level of discrimination of each employer. Thus, the distaste of female employees implies an increase in cost of hiring for the employers. Since employers wish to maximize firm profit based on the monetary cost and revenue, it is found from the theory that employers experience disutility from discrimination, such that they could either hire wrong groups or numbers of labor. Therefore, they are likely to earn less profit than non-discriminate employers. For example, the increase in cost of hiring female managers due to employer discrimination may cause the reduction of number female managers hiring.

In addition, we hypothesize that the difference between men and women holding managerial position is affected by the gender composition within the occupations. Discrimination from internal employees or co-workers could be associated with the difference between genders in holding managerial positions, especially in female-dominated occupations as workers prefer to cooperate with male managers over female managers. Male skills are seen as more needed in these occupation fields, which is creating barriers for females in internal promotion processes. Moreover, Weber's (1968) social closure theory framework suggests that males are overrepresented among authority positions – especially male employees who work in female dominated occupations, as they are likely to hold supervisory positions. Since men in this dynamic are the minority group, they preserve power and privileges for themselves by limiting opportunities of mobility for women (Smith, 2002). Therefore, male managers benefit their gender such that they want to maintain authoritarian position by excluding female candidates. Literature on social psychology has noted that minority groups enhance their own group members to strengthen their bargaining power, just as male workers tend to foster relationships with their male managers (Lincoln and Miller, 1979). The evidence from William's research (1989) on gender differences at work suggests that the bonding relationship encourages male subordinate promotion to management position. These theories indicate that men reap benefits from working in female dominated occupations such that they still have more advantages in such positions that help them climb promotion ladders. Their skills become more valuable in such a dynamic and they are able to nurture strong bonding relationship with male supervisors.

The lack of knowledge of individuals could lead to statistics-based discrimination, caused by the asymmetric information between employers and employees. Employers may rely heavily on the average characteristics of the groups as a productivity proxy when they make hiring and promotion decision (Phelps, 1972). Therefore, women are unbeneficial in terms of receiving promotion and training opportunities because they are assumed to have less commitment, solidarity, and past experience in the field of work when compared to men. As a result, employers are likely to invest less on female workers. As Lang (1986, 1993) shows, male managers may misjudge their female employees' performance due to the fact that males and females express different cultures and languages. In this case, different languages refer to the way of communication based on natural psychology between each gender. Thus, the gendered differences in verbal and nonverbal languages may act as obstacles for women to get promoted by male supervisors. In addition, females are unbeneficial in transition into management due to the lack of past references (Montgomery, 1991). As females are considered inferior in holding upper positions, there are less pieces of evidence validating females' capacity for managerial performance. This situation could lead to ambiguous perspectives on female employee's capability. Thus, male employees receive more chances to be promoted into higher managerial positions.

We therefore firstly hypothesize that there is a difference in holding a managerial position between women and men such that women are less likely than men to be promoted up levels of authority hierarchies due to the glass ceiling. Based on these theories, we further make the second hypothesis that this difference is affected by the gender composition within the occupations as the percentage of women workers negatively affects women's possibilities of holding a managerial position, but nurture men workers instead.

Literature Review

Discrimination in holding different managerial position of men and women have been studied widely and proved in many previous studies. In Baxter and Wright (2000) study, it examines that women face greater difficulty in holding managerial position as they move up the hierarchy by using data from Comparative Class Analysis Project (Wright, 1989, 1997) and chose two cross-sectional surveys which available for three countries: the United States, Sweden, and Australia. The result showed that in all three countries, men and women have different probability to hold managerial position, even with a range of personal attributes included in the equation. In the United States, women face a disadvantage in holding lower

levels of the managerial hierarchy but not upper levels of the managerial hierarchy. In Sweden and Australia, women face disadvantage on holding the middle of managerial hierarchies more than at the top levels. Baxter and Wright determined that employers and managers have low preference for promoting women to a managerial position. Furthermore, women had obstructed to access in power of management. As a result, women are hindered from promotion to higher level of management. The reason can be because of sexism, which creates women to escape from important information. This study of Baxter and Wright confirms that women and men have different probability to holding managerial position.

Further of the result, Baxter and Wright indicated that the relative disadvantages women face in promotions are greater in the upper levels of managerial positions more than at the bottom levels of managerial positions which is the effect of glass ceiling. From the result, the glass ceiling has small effect in the United States but large effect in Sweden and Australia. Data from Wright (1989) has illustrated that around 25-30 percentage of lower level of supervisor are female while CEOs and top executive position have little percentage of female, this can be proof of the glass ceiling effect. And in Japan, Reskin and Padavic (1994) found the similar direction of result as Wright found, they found that 7.5 percent of all managers are women but only 0.3 percent of top manager are women. The report of the State of Wisconsin Task Force on the Glass Ceiling Initiative (1993, 9) states that 47 percent of supervisors and 42 percent of middle management were women but only 34 percent of upper management and 18 percent of executives were women. In 1991, U.S. Department of Labor "Report on the Glass Ceiling Initiative" makes similar observations by using 94 randomly sampled interviews of corporate with headquarters of *Fortune* 1000 sized companies between 1989 and 1991. It observed that while 37.2 percent of all employees of these companies were women, only 16.9 percent of all levels of management and 6.6 percent of managers at the executive level were women.

The glass ceiling had been observed and confirmed by previous studies. Women who are working in female-dominated occupation will get stuck in the managerial position movement as the result of glass ceiling that causes an invisible barrier to block them from the mobility. Maume (1999) examine the effect of race and gender composition in the origin occupation on movement to a managerial position by using Panel Study of Income Dynamics in 1981. He found that among men, each 10% increase in the percentage of female workers in the occupation increases the chances of attaining a managerial position by 11.1%. And he also found that among women, each 10% increase in the percentage of females in an occupation

slows the rate of entry into management by 6%. This shows that percentage of women in workplace have negative effect to women's chance in attaining a managerial position. This study obtains the concept of the glass ceiling. A study by Hultin (2003), also obtained results that point in the same direction. He analyses data from Swedish Level of Living Survey in 1991. The result indicates that men who work in female dominated occupations have substantially better internal promotion chances than women who work in such occupations. From Cockburn (1991), the study indicated that for men, who work in female segregated occupation, they get favor from working there in competing among themselves, which is a minority, to get higher chance in getting managerial position and receive higher wages.

For glass ceiling effect, the case study done by Kanter (1977) summarized that sex segregation in workplace is beneficial for men but an obstacle for women in receiving a chance for a promotion within the job. From Kanter, women are minority at work and they get ability to access for information in the work is limited. And because of this obstacle, women tend to have lower chance to get managerial position in male dominated occupations (Reskin & Hartmann, 1986). To elaborate on the effect of co-worker, females who work in male dominated occupation feels uncomfortable working with male co-workers because they get hidden from showing performance. Females who are working in female dominated occupations has been blocked from promotion because male minority tend to overshadow female co-worker peers and showing their performance with less effort compared to female. Particularly, Walshok (1981) discovers that female pioneers did not get treated by male co-workers the same way as other male new worker did. This shows that females get blocked from both working in male and female dominated occupations. First, working in male's job creates less opportunities to compete with majority of male worker and have to work in uncomfortable environment. Second, working in female's job create less chance to receive higher position since their ability get less shining compare to minority of men who consider as potential worker.

On the other hand, women can get less chance in promotion because of their skill does not reach the certain level that supervisor needs. Since women are more favorable for other things instead of working such as housework, so the firm will have less tension to invest on the job training for women, causing them to have less potential in holding the managerial position (De la Rica et al., 2005). Particularly, Jellal et al. (2006) found that female is uncertain in productivity level in the labor market because women tend to get interrupted by family

situation, such as the need to care for children or elders, hence women have higher possibility to quit the jobs and take on household work instead. Because of this, firms find that investing in job training for women is not profitable for them, since then women are less qualified and have less chance to get promoted. Kanter (1997) found the result in sex segregation in similar direction as Jellal. She found that from previous job, women do not get proper training for the job, therefore they cannot compete to get managerial position with other workers such as men.

Data

In this study, there are two sources of data combined, which are both macro-data as well as individual micro-data. Firstly, we use Japanese General Social Surveys (JGSS), conducted by JGSS Research Center at Osaka University of Commerce. This data is representative of a cross-sectional survey of solicit political, sociological, and economic information from people living in Japan such as age, marital status, career title, etc. The survey is based on the nationwide population aged 20-89 that amounts to 9000 units of observations. We use the data in the year of 2010, which is the most complete and latest available data. In 2010, the response rate was 62.2 percent, which results in around 5003 observations. Within the research, we aim to study both the differences between genders in holding a managerial position as well as the effect of gender composition in the occupations. In order to analyze gender differences in holding a managerial job we make use of information about what main occupation titles an individual holds. The seven title categories included are no managerial post, group leader, sub-section head, section head, department head, general manager, and executive. This information is available only for employees and shows whether the individual holds a managerial position or not, therefore we only include the data on individuals who are regular employees or executives of large companies or organizations. Furthermore, we made the selection on the age group between 20-64 years old[2] who are currently active on the labor market as our sample group. According to the first stage selection, we are left with 1587 units of observation, 539 units are female and 1,048 units are male.

Secondly, the Data on the gender composition of each occupation is collected from the Japanese yearbook of labor statistics conducted by the Ministry of health, labor and welfare. The data contains information concerning the number of female and male employees in 98 occupations in the year 2010, such that we are able to make the computation on the rate of

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[2] We only include 20-64 years old worker as they are within the Japanese working age according to OECD data.

female participant in each occupation[3]. Then, we categorized occupations as female dominated if the occupation in question contains at least 75 percent of female participants following the example from the previous literature by Hegewishch and Hartman (2014). Subsequently, we performed manual adjustment by which we matched the identical occupations with the occupation code from the macro data to the social survey data. However, we have to exclude 8 out of 98 occupations[4] that do not match with any occupation in the survey data. With the adjusted gender composition data set, we merged the composition rate data with the social survey data for the matched occupations in order to conclude whether the occupations are female dominated or not.

Furthermore, we dismiss all of the missing value observation so that we are left with a total of 760 units of observation wherein 258 units are female and 502 units are male as our final sample selection. Associated with the probability of holding managerial position, we acknowledge concerns on several independent variables which are age of respondents, the level of education, area of residence, number of years at work as well as family situation; marital status, number of children, and responsibility on taking care of other family members.

Table 1 presents descriptive statistics, which are the mean value of each independent variable for males and females in our sample. On average, males are approximately four years older than females. It is noticeable that males have a higher rate of attaining a university education than females, which could potentially relate to their higher possibility of holding managerial positions. However, females have a higher rate of attaining secondary education, which is high school and college level, but lower in primary education level. Males have around nineteen and sixteen percentage points higher in being married and having children, respectively. Both males and females have similar percentages of having responsibilities for taking care of other family members. Also, all of the regions of residence show similar distribution levels, which include large city, medium city, and village. According to the table, males and females share similar percentage points of number of years they had been working in the current job. Also, females are around thirty percentage points higher in being an employee; in other words, no managerial status holding. As for the rank, it is observable that

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[3] The rate of female participant is computed by the number of female participation divided by the total number of participants for each occupation.

[4] 8 excluded occupations are chemical analyst, ticket seller and ticket examiner, metallic materials inspecting worker, light electric equipment inspecting worker, semiconductor tips maker, scaffold worker, navvy and stevedore.

there is less share of females occupied in all of the managerial positions than males. In regards to females, there is a conspicuous pattern as the rank grows higher the share of females declines, except in the case of executive level positions, which has a nearly similar percentage as group leader (the lowest managerial title rank). In regards to males, there is less of a clear pattern; however, it is noticeable that the share of males increases as the rank grows from group leader, sub-section head, and department head, respectively. There is a drop for males of holding positions such as general manager and executive, but there are still higher shares of males when comparing to females within these positions.

Table 1: Descriptive statistics, by gender in the year of 2010

	Female	Male
Age	39.111	42.039
Primary education	0.483	0.500
Secondary education	0.288	0.123
University	0.229	0.377
Married	0.528	0.711
Having children	0.511	0.672
Responsibility for other family members	0.256	0.224
Large city	0.207	0.210
Medium city	0.534	0.537
Town/village	0.259	0.253
Years at work	15.966	15.993
No managerial post (employee)	0.820	0.540
Group leader	0.054	0.094
Sub-section head	0.039	0.105
Department head	0.026	0.114
General manager	0.004	0.052
Executive	0.057	0.095
Number of individuals	258	502

Source: Japanese General Social Surveys (JGSS), conducted by JGSS Research Center at Osaka University of Commerce

Table 2 presents descriptive statistics for male and female individuals in 2010. The table reveals the average value of individuals by gender in different occupation compositions, which are females and males who works in female dominated occupations and non-female dominated occupations. On average, females are younger than males for both types of occupations. For education, females and males have similar rates of primary education level attended for both non-female and female dominated occupations. This is also similar for secondary education levels except that females have a higher rate of attending secondary education in female dominated occupations. It is obviously shown that males possess higher rates of attending university level in female dominated occupations, which may lead to their higher probability of holding managerial positions. Males are more likely to get married and have children than females. Females who work in female occupations have higher degrees of responsibilities towards other family members, which could result in their disadvantages regarding improvement of their skills and attainment of occupation achievement. They may prefer to segregate themselves into occupations that are suitable for their general human capital and non-training skills (female occupations) than females who have less responsibility. Females and males who work in female dominated occupations are likely to reside in similar proportions in each size of areas. Even males have around five years more experience working in their current job for female dominated occupations, when females and males should have analogous number of years of current career experience on average due to the same average age of our sample.[5] At the same age, females who work in non-female dominated occupations have more than twice the amount of experience in the current job than females who work in female dominated occupations. Regardless of occupation composition, females are overrepresented in being employees than males. In sub-section and department head positions, there are fewer shares of females who work in female dominated occupations than in non-female dominated occupations. In contrast, females in female dominated occupations hold higher shares of having general manager and executive titles than females who work in non-female dominated occupations. Besides group leader positions, there are higher shares for males who work in female dominated occupations in every rank of managerial positions than those who work in non-female dominated occupations. These statistics corroborate with our theories as we had discussed that males may experience benefits in working in dominated occupations in terms of promotion advancement.

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[5] Since, the average age of our sample for female and male in female dominated occupation is around 5 years as well.

Table 2: Descriptive statistics, by occupation composition in the year 2010

	Female dominated occupation		Non-female dominated occupation	
	Female	Male	Female	Male
Age	39.412	43.153	37.502	40.439
Primary education	0.486	0.448	0.471	0.574
Secondary education	0.313	0.123	0.151	0.123
University	0.201	0.429	0.378	0.303
Married	0.557	0.745	0.371	0.661
Having children	0.525	0.718	0.431	0.606
Responsibility for other family members	0.278	0.220	0.143	0.231
Large city	0.200	0.227	0.241	0.185
Medium city	0.529	0.526	0.562	0.554
Town/village	0.270	0.248	0.197	0.261
Years at work	13.267	18.432	30.411	12.490
No managerial post (employee)	0.821	0.473	0.820	0.636
Group leader	0.054	0.063	0.052	0.138
Sub-section head	0.038	0.129	0.048	0.070
Department head	0.015	0.131	0.080	0.089
General manager	0.004	0.076	0.000	0.019
Executive	0.068	0.128	0.000	0.048
Number of individuals	218	301	40	201

Source: Japanese General Social Surveys (JGSS), conducted by
JGSS Research Center at Osaka University of Commerce

Methodology

In this section, we provide explanations of the models used in our analysis. We will explore whether there is a glass ceiling for women in Japan as there is a different probability in holding higher managerial positions between women and men, and we will explore to what extent this difference is affected by the gender composition within the occupation by

estimating a series of ordered logistic regressions. Regards to information provided by the Japanese General Social Surveys, occupation titles are presented in seven title categories, which are no managerial post, group leader, sub-section head, section head, department head, general manager, and executive. As for the simplicity, we categorize all of the managerial statuses into suitable ranks from no managerial title to the highest. (see Baxter and Wright, 2000) The data we use allow us to categorize employees in the labor force into four levels: 1 = non-management; employee, 2 = low managers; group or sub-section head, 3 = middle managers; section or department head, and 4 = top managers; executive.

It is important to note a fundamental difference between a regression model where the regressand Y is quantitative and a model where it is qualitative. Since in our research, the regressand is qualitative, our objective is to find the probability of something happening, known as probability model. We want $E(Y_i | X_{1i}, X_{2i}, ..., X_{ki})$ where X's are regressors, both qualitative and quantitative.

Within this study, we choose to estimate ordered logit model such that it allows us to examine the difference between males and females concerning the probability of individuals holding different levels of managerial positions. Then, we provide a prediction of the conditional probability of an individual belonging to a certain rank.

To analyze our two hypotheses, we estimate two specifications of our ordered logit model for males and females separately. The first hypothesis predicts the difference in holding a managerial position between women and men such that women are less likely than men to be promoted to upper levels of authority. Thus, we expected the probability of holding managerial titles of females is less than males, and this difference increases as one examines higher managerial levels. The second hypothesis predicts this difference in holding a managerial position between women and men is affected by the gender composition within the occupations, as working in female dominated occupations negatively affects women's possibility of holding a managerial position, but nurture men workers' possibility instead. Hence, we expected the probability of holding managerial positions for females who work in female dominated occupations is less than that of non-female dominated occupations.

Specification 1 controls for gender orientation, gender composition; whether an individual working in female dominated occupation or not, age, the level of education, area of residence,

number of years at work as well as family situation; marital status, number of children, and responsibility of taking care of other family members. Thus, we could observe whether there is a difference in holding a managerial position between women and men:

Specification1:

$$\Pr(Y = i) = \alpha_0 + \alpha_1(female) + \alpha_2(female\_dom) + \beta X_i + \varepsilon_i$$

Where:

$\Pr(Y = i)$ is the probability of holding managerial positions in different levels, where i = 1 when individuals are employee, no managerial status, i = 2 when individuals hold group or sub-section head titles, i = 3 when individuals hold section or department head titles, and i = 4 when individuals hold executive title. We will use a dummy variable *female,* which takes the value of 1 if the individual is a woman and the value of 0 if the individual is a man. The reference category – benchmark category - in our estimation is male workers. Also, we include another dummy variable *female_dom* which takes the value of 1 if the individual is working in female dominated occupations and the value of 0 if the individual is working in non-female dominated occupations.

The coefficient α_1 shows the difference probability of holding managerial position between males and females. To be more explicit, if the coefficient estimate is positive, this implies that women have higher probability of holding managerial status, while if it is negative, it implies that men have higher probability of holding managerial status. If the coefficient is null, there is perfect equivalence between men's and women's probability.

The coefficient α_2 shows the difference probability of holding managerial position for individual between working in female dominated occupation or not. If the coefficient estimate is positive, this implies that individuals who work in female dominated occupations have higher probability of holding managerial status, while it is negative, it implies that individuals who work in non-female dominated occupations have higher probability of holding managerial status.

Within the equation, ε_i represents error term, residual and X_i represents controlled variables, which are age, the level of education, area of residence, number of years at work as well as family situation; marital status, possess children, responsibility on taking care of other family

members, which will be explained as the following.

To a large extent, this study follows the same controlled variable selection as Maume (1999). It is found that elder adults lack eagerness and are less likely to receive a promotion (Higgins, 1998), we therefore controlled the age of individuals of our sample. Since, age is entered as a numerical variable so we also include age squared in order to control for non-linear effects. Education level is in fact a determinant of career advancement: higher education is associated with better performance at the workplace. Hence, the education level is controlled as dummy variables using the information on the highest level of education the respondent attained: primary level if they attended elementary to high school, secondary level if they attended college – as the reference category, and university level if they attended college. In addition, researches show that marriage as well as family responsibility also influences the rate of labor participation and the type of occupation selected, especially for women (Johnson et. al, 1974). These factors are related to the level of motivation and intensity of work, e.g. married women pursue less demanding jobs, such as part-time and no tenure-track positions due to household responsibilities (Becker, 1985). Therefore, worker's family situation was controlled as binary variables. Marital status is equal to 1 if an individual is married and 0 otherwise, as well as having children in the family if an individual is having at least one child, *having children* is 1 and 0 if individual does not have a child. The model also includes the variable of responsibility that may affect the probability of getting promoted, which is responsibility for other family members as a binary variable on condition that the respondent has to take care of other members in the family, responsibility for other family members is 1 and 0 if individual does not have any responsibility for other family members. The location of residence may vary the opportunity of gaining managerial status due to the size of the city, thus we enter controlled dummy variables; the municipality size as large city, medium city, and village, where village is considered as reference category. Also, we control the number of years the respondents had been working in the current occupation, since more experience within the job may lead to higher potential of getting promoted to managerial positions.

Using specification 2 we aim to further explore how gender composition in the occupation affects the probability of holding a managerial position between women and men.

Specification2:

$$\Pr(Y = i) = \alpha_0 + \alpha_1 (female \times female\_nondom) + \alpha_2 (female \times female\_dom) + \alpha_3 (female\_dom) + \beta X_i + \varepsilon_i$$

The dependent variable is the same as above. Here, males working in occupations that are not dominated by females is the reference group.

Where:

P_i is the probability that $Y_i = 1$ if the individual holds a managerial status and 0 if does not. The coefficient α_1 is then the difference between females and males in occupations that are not dominated by females. α_2 is the difference between females and males in occupations that are dominated by females. α_3 is the difference between males working in female dominated occupations and males working in occupations that are not dominated by females. X_i is other controlled variables to the same extent as in specification 1.

As was the case with logit models, the parameters for an ordered logit model can be hard to interpret. Adjusted predictions and marginal effects can again make results more understandable. Thus, we compute the marginal effect of being female on the probability of having certain rank of managerial status.

Having introduced our data, data source and data description, the model specification and estimation, we can now present our results.

Result

Table 3 presents the specification1 in ordered logit estimations of managerial rank for female and male individuals and marginal effects. The coefficient for female in column (1) shows that female have a 25 percentage points higher probability to hold non-management status compared to males. The difference is statistically significant at 1 percent significant level. Further, women have negative lower probability to hold managerial position compared to men irrespective of management level. Women have lower probability in hold low management, middle management, and top management positions than men for 12 percentage points, 9 percentage points, and 5 percentage points respectively at 1 percent significant level. It shows that the differential between females and males decreases as one moves up in the hierarchy.

Table 3: Specification1, ordered logit estimations of managerial rank for female and male individuals, marginal effects (standard errors within parentheses).

	Type of managerial rank			
	(1)	(2)	(3)	(4)
	Non-management	Low managers	Middle managers	Top managers
Female	0.252***	-0.117***	-0.0855***	-0.0490***
	(0.0348)	(0.0206)	(0.0134)	(0.00767)
Female dominate occupation	-0.0996***	0.0451***	0.0345***	0.0200***
	(0.0356)	(0.0169)	(0.0124)	(0.00744)
Predicted Probability	0.6841	0.1753	0.0936	0.0470
Age	-0.0804***	0.0354***	0.0283***	0.0166***
	(0.0153)	(0.00815)	(0.00562)	(0.00330)
Age2	0.0763***	-0.0336***	-0.0268***	-0.0158***
	(0.0172)	(0.00883)	(0.00622)	(0.00362)
Primary education	0.0811	-0.0357	-0.0286	-0.0169
	(0.0527)	(0.0234)	(0.0186)	(0.0112)
University	-0.0183	0.00801	0.00646	0.00382
	(0.0535)	(0.0232)	(0.0190)	(0.0113)
Married	-0.103**	0.0467**	0.0358**	0.0207**
	(0.0453)	(0.0214)	(0.0156)	(0.00942)
Having children	-0.0170	0.00751	0.00596	0.00350
	(0.0466)	(0.0208)	(0.0163)	(0.00951)
Responsibility for other family members	-0.00334	0.00147	0.00118	0.000693
	(0.0397)	(0.0175)	(0.0140)	(0.00826)
Large city	-0.0137	0.00599	0.00484	0.00287
	(0.0517)	(0.0224)	(0.0183)	(0.0110)
Medium city	-0.0102	0.00448	0.00357	0.00210
	(0.0392)	(0.0173)	(0.0138)	(0.00813)
Years at work	0.0000115	-0.00000509	-0.00000406	-0.00000239
	(0.0001)	(0.0000)	(0.0000)	(0.0000)
Number of observations	760	760	760	760

Note: The results are weighted and adjusted for the sampling design using Stata svy commands. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. *Source: Japanese General Social Surveys (JGSS), conducted by JGSS Research Center at Osaka University of Commerc and own calculations.*

For coefficient of female dominated occupation shows that individuals who work in female dominated occupation holding non-management position lower than individual who work in non-female dominated occupations for 10 percentage points at 1 percent significant level while to hold managerial positions are having positive probability when working in female dominated occupations. Individual have probability to holding low management, middle management, and top management position for 5 percentage points, 3 percentage points, and 2 percentage points respectively compare to work in non-female dominated occupations at 1 percent significant level. The result referred as working female dominated occupation is positive significant for holding managerial position more than holding non-managerial positions.

For predicted probability in specification 1 shows that, as the probability of the dependent variable equal to 1, with all independent variables set at their mean value, the predicted probability of holding non management position for women is at 68 percentage points while holding low, middle, and top manager position are 18 percentage points, 9 percentage points, and 5 percentage points respectively. The result shows that predicted probability of women to hold managerial position has negative correlation to the hierarchy. To hold low manager positions, women have lower chance than holding non management positions for 51 percentage points corresponding to a 74% decrease in the probability. This suggests that women have less chance to hold higher manager position compared to lower manager position.

For coefficient of age, it interprets as when age increase one year, the probability to hold non-managerial position decrease for 8 percentage points in increasing rate while it increases probability in holding low management, middle management, and top management position for 4 percentage points, 3 percentage points, and 2 percentage points respectively in decreasing rate which is significant at 1 percent significant level. Age is significant for both holding managerial and non-managerial positions as individuals could experience and learn more so that accumulate human capital increases with growing age. However, age is positive significant with decreasing probability of holding managerial positions in the higher ranks because productivity and motivation tend to decline with higher age.

For education, they are not significant due to different in holding a managerial position between women and men in Japan. Due to fact that Japanese people possibly give important

to experience more than education. However marital status is significant. Individual who are married have negative possibility to holding non-management position for 10 percentage points but have positive possibility to holding low, middle, and top managerial positions for 5 percentage points, 4 percentage points, and 2 percentage points respectively which is significant at 5 percent significant level. In Japan, individual who are married considered as a person who have much responsibility, which might work for full capacity and be most efficient result for the firm.

For coefficient of "having children", individual who have children have higher probability of holding managerial position than the one who does not. However, it is not statistically significant, as well as "responsibility for other family members" does. Regards to the size of area of resident either in large city or medium city comparing to living in small town, it negatively effects to probability of holding non-management position but positively effects to probability of holding management position. But it is not statistically significant. For coefficient of "years at work", it is insignificant effect to probability of holding managerial and non-managerial status and the values is closing to 0.

Table 4: Percentage change of the predicted probabilities of holding managerial positions due to a one unit increase in independent factors in specification 1.

	Type of managerial rank			
	(1)	(2)	(3)	(4)
	Non-management	Low managers	Middle managers	Top managers
Female	0.3684	-0.6674	-0.9135	-1.0426
Female dominate occupation	-0.1456	0.2573	0.3686	0.4255

Source: Japanese General Social Surveys (JGSS), conducted by JGSS Research Center at Osaka University of Commerc and own calculations.

Table 4 shows percentage change of the predicted probabilities of holding managerial positions due to a one unit increase in independent factors in specification 1. The result shows that different probability between females and males has a positive effect on the predicted probability for holding non management position but has a negative effect on holding management position. Especially on top manager positions, different probability between females and males seems to decrease the predicted probability of holding top manager positions by 104%, while it decrease the predicted probability of holding middle and low manager positions only 91% and 67% respectively. Furhermore the different probability between individual who work in female dominated occupation and non female dominated

occupation has a negative effect on the predicted probability for holding non management position but has a positive effect on holding management position. The different probability between individual who work in female dominated occupation and non female dominated occupation seems to increase the predicted probability of holding low, middle and top manager positions by 26%, 27% and 43% respectively while it decrease the predicted probability of holding non management position by 15%.

Table 5: Specification 2, ordered logit estimations of managerial rank for female and male individuals, marginal effects (standard errors within parentheses).

	Type of managerial rank			
	(1)	(2)	(3)	(4)
	Non-management	Low managers	Middle managers	Top managers
Female x Non-female-dominated occupation	0.135	-0.0662	-0.0444*	-0.0243*
	(0.0853)	(0.0468)	(0.0260)	(0.0134)
Female x Female-dominated occupation	0.263***	-0.126***	-0.0881***	-0.0496***
	(0.0350)	(0.0206)	(0.0138)	(0.00781)
Female dominate occupation	-0.115***	0.0522***	0.0397***	0.0229***
	(0.0368)	(0.0174)	(0.0131)	(0.00783)
Predicted Probability	0.6833	0.1760	0.0938	0.0469
Age	-0.0808***	0.0356***	0.0284***	0.0167***
	(0.0153)	(0.00815)	(0.00568)	(0.00332)
Age2	0.0767***	-0.0339***	-0.0270***	-0.0158***
	(0.0172)	(0.00883)	(0.00628)	(0.00364)
Primary education	0.0840	-0.0369	-0.0296	-0.0174
	(0.0529)	(0.0236)	(0.0187)	(0.0112)
University	-0.0136	0.00597	0.00480	0.00282
	(0.0536)	(0.0234)	(0.0190)	(0.0112)
Married	-0.106**	0.0482**	0.0369**	0.0213**
	(0.0452)	(0.0212)	(0.0156)	(0.00941)
Having children	-0.0143	0.00634	0.00503	0.00295
	(0.0471)	(0.0210)	(0.0165)	(0.00961)
Responsibility for other family members	-0.00507	0.00223	0.00179	0.00105
	(0.0399)	(0.0175)	(0.0141)	(0.00829)
Large city	-0.0125	0.00546	0.00441	0.00260
	(0.0519)	(0.0225)	(0.0184)	(0.0109)
Medium city	-0.00926	0.00409	0.00326	0.00191

	(0.0395)	(0.0174)	(0.0139)	(0.00816)
Years at work	0.0000362	-0.0000160	-0.0000128	-0.00000748
	(0.0001)	(0.0000)	(0.0000)	(0.0000)
Number of observations	760	760	760	760

Note: The results are weighted and adjusted for the sampling design using Stata svy commands. * p < 0.10, ** p < 0.05, *** p < 0.01. *Source: Japanese General Social Surveys (JGSS), conducted by JGSS Research Center at Osaka University of Commerc and own calculations.*

Table 5 presents Specification 2 in ordered logit estimations of managerial rank for female and male individuals and marginal including the variables of interest showing interaction effects. According to specification 2, coefficient of Female x Non-female-dominated occupation show that difference between females and males in occupations that are not dominated by females are significant only middle managers and top managers. The interpretation is female who are working in non-female dominated occupation have less chance to holding middle and top managerial position for 4 percentage points and 2 percentage points respectively compare to men at 10 percent significant level. Compare to coefficient of Female x Female-dominated occupation, which interpret as is the difference between females and males in occupations that are dominated by females. Women who work in female dominated occupation holding non-management position higher than to men for 26 percentage points but they are holding low, middle, and top management position lower than men for 13 percentage points, 9 percentage points, and 5 percentage points respectively at 1 percent significant level. This is showing that women having difficulty to holding managerial position compare to men when they are working in female dominated occupation because the percentage to hold the managerial position, especially for middle and top, less than men compare to when they are working in non-female dominated occupation for 5 percentage points and 3 percentage points respectively.

The coefficient of Female dominated occupation is interpreted as the difference between males working in female dominated occupations and males working in occupations that are not dominated by females. The result shows as males are significant in less holding non-management occupation in female dominated occupations for 11 percentage points compare to male who are working in non-female dominated occupations. But for low, middle and top management position are positive significant with 5 percentage points, 4 percentage points, and 2 percentage points respectively at 1 percent significant level.

For predicted probability in specification 2, the predicted probability to holding non management position for women is 68 percentage points while holding low, middle, and top manager position are 18 percentage points, 9 percentage points, and 5 percentage points respectively. The numerical results are not different from the results in specification 1 which shows that predicted probability of women to hold managerial position decrease as they move up to higher hierarchy. This suggests that women have less chance to hold higher manager position compared to lower manager position when they are working both in non female dominated occupation and female dominated occupation.

For coefficient of age, the result is the same direction as in specification1 that age is negative significant for holding non-managerial position, but positive significant for holding low management, middle management, and top management position with the value closing to specification1. For coefficient of education, they are not significant due to different in holding a managerial position between women and men in Japan. But marital status is significant as it does in specification 1. And the effect of marital status is the same direction as it occurs in specification 1 as well and percentage point of probability close to exactly of probability in specification 1. For coefficient of "having children", "responsibility for other family members", "large city", "medium city" and "years at work" are statistically insignificant and similar magnitude to the result in specification 1.

Table 6: Percentage change of the predicted probabilities of holding managerial positions due to a one unit increase in independent factors in specification 2.

	Type of managerial rank			
	(1)	(2)	(3)	(4)
	Non-management	Low managers	Middle managers	Top managers
Female x Non-female-dominated occupation			-0.4733	-0.5181
Female x Female-dominated occupation	0.3849	-0.7159	-0.9392	-1.0576
Female dominate occupation	0.3849	-0.7159	-0.9392	-1.0576

Source: Japanese General Social Surveys (JGSS), conducted by JGSS Research Center at Osaka University of Commerc and own calculations.

Table 6 shows percentage change of the predicted probabilities of holding managerial positions due to a one unit increase in independent factors in specification 2. The result shows that difference probability between females and males who work in occupations that are not dominated by females has a negative effect on holding management position only in middle

and top manager position by 47% and 52%. For the difference probability between females and males who work in occupations that are dominated by females and the difference probability between males working in female dominated occupations and males working in occupations that are not dominated by females have a positive effect on the predicted probability for holding non management position but has a negative effect on holding management position and the percentage of the effect by both independent factors are exactly the same. For both independent factors, they increase the predicted probability of holding non management position by 38% while they decrease the predicted probability of holding low, middle and top manager positions by 72%, 94% and 106% respectively.

Discussion and Conclusion

The main contribution of this research considering two main interests is to observe the difference in holding a managerial position between women and men in Japan and how it is affected by gender composition within the occupations.

The results suggest that women have lower probability of holding managerial positions irrespective of management level comparing to men. In line with our theoretical framework, women face difficulties in position advancement in Japan, which could be the consequence from both supply and demand side factors. As female workers may get discriminated in the labor market as well as they prefer to invest less human capital than male workers. However, we can observe the differentials are decreasing as the managerial positions move up into higher managerial hierarchies. This finding indicates that women have higher chance to hold higher positions. Thus, it is contradict to our hypothesis in the way that the superiority of men is decreasing as the positions increase showing weaker glass ceiling effect at the higher rank for Japanese women. One of the possible reasons is that individuals' abilities are taken into account rather than sex in order to receive a higher managerial promotion.

In addition, the result suggests that the gender composition also matter in probability of holding managerial status between male and female in Japan. We inspect that female had less probability in holding managerial positions than male for both female dominated occupation and non-female dominated occupation, though the difference probability in holding managerial status between genders is greater in female dominated occupation. Therefore, females who works in typically female dominated occupations are worsen in holding managerial status than in non-female dominated occupations. This finding shows the effect of

glass ceiling that occurs when women work in female dominated occupation as it follows the theory that women are less chosen to hold managerial position compare to men in "female's job". This suggests that female workers are unbeneficial in working in female dominated occupations, since their skills are ignored (Maume, 1999) as well as the lack of previous female performance records as managers (Montgomery, 1991). Moreover, this result may support male workers' position advancement as glass escalator, which it is referred as the invisible escalator to carry male up to higher positions when they are working in female dominated occupations (Williams 1992, 1995).

In conclusion, it indicates that there is a difference in holding managerial title between male and female. Furthermore, it shows glass ceiling effects, which is located more around lower of managerial hierarchies than at the middle and top. In Japan, female workers happen to be particularly disadvantaged comparing to male that there are difficulties in position advancement.

Even the existence of policy[6] encouraging gender toward equality in Japan, it is mainly concerned only the issue of wage gap between men and women in the labor market. However, the difference in career advancement between genders is one of the main factors causing the wage gap. Thus, the solution of this problem could be either law enforcement or raising awareness of individuals within the country that men and women are supposed have equal opportunity to receive promotion.

In addition, it would be interesting to perform a study concerning an effect of glass escalator in the way that men enjoyed enhanced mobility as they are working within female dominated occupations.

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[6] The Equal Employment Opportunity Law (EEOL), which was established since 1985. The law prevents women from discriminate in recruiting, hiring, assignments, and promotion within the workplaces.

Reference

Abe, M., Hamamoto, C. and Tanaka, S., 2004. *Reconciling work and family: Issues and policies in Japan*. ILO.

Albrecht, J., Björklund, A. and Vroman, S., 2003. Is there a glass ceiling in Sweden?. *Journal of Labor economics*, *21*(1), pp.145-177.

Altonji, J.G. and Blank, R.M., 1999. Race and gender in the labor market. *Handbook of labor economics*, *3*, pp.3143-3259.

Anker, R., 1998. *Gender and jobs: Sex segregation of occupations in the world*. International Labour Organization.

Arulampalam, Wiji, Alison L. Booth, and Mark L. Bryan. "Is there a glass ceiling over Europe? Exploring the gender pay gap across the wage distribution." *ILR Review* 60.2 (2007): 163-186.

Baron, A.S., 1987. Working partners: Career-committed mothers and their husbands. *Business Horizons*, *30*(5), pp.45-50.

Baxter, J. and Wright, E.O., 2000. The glass ceiling hypothesis a comparative study of the united states, sweden, and australia. *Gender & society*, *14*(2), pp.275-294.

Becker, G., 1981. A treatise on the family Harvard University Press. *Cambridge, MA*, *30*.

Becker, G.S., 1985. Human capital, effort, and the sexual division of labor. *Journal of labor economics*, *3*(1, Part 2), pp.S33-S58.

Becker, G.S., 2010. *The economics of discrimination*. University of Chicago press.

Charles, Maria, and David B. Grusky. *Occupational ghettos: The worldwide segregation of women and men*. Vol. 200. Stanford, CA: Stanford University Press, 2004.

Cockburn, C., 1991. *In the way of women: Men's resistance to sex equality in organizations* (No. 18). Cornell University Press.

Gujarati, Damodar N, and Dawn C Porter. *Basic Econometrics*. 1st ed. [USA]: McGraw-Hill/Irwin, 2017. Print.

Hegewisch, A. and Hartmann, H., 2014. Occupational segregation and the gender wage gap: A job half done.

Higgins, E.T., 1998. Promotion and prevention: Regulatory focus as a motivational principle. *Advances in experimental social psychology*, *30*, pp.1-46.

Hultin, M., 1996. Gender differences in authority attainment: The Swedish case. In *RC28 Social Stratification Conference,* MONTH*.

Hultin, M., 2003. Some take the glass escalator, some hit the glass ceiling? Career consequences of occupational sex segregation. *Work and occupations*, *30*(1), pp.30-61.

Johnson, G.E. and Stafford, F.P., 1974. The earnings and promotion of women faculty. *The American Economic Review*, *64*(6), pp.888-903.

Kanter, R.M., 1977. (1977a). Men and women of the corporation. New York: Basic Books.

Kumlin, J., 2007. The sex wage gap in Japan and Sweden: The role of human capital, workplace sex composition, and family responsibility. *European Sociological Review*, *23*(2), pp.203-221.

Lang, K., 1986. A language theory of discrimination. *The quarterly journal of economics*, *101*(2), pp.363-382.

Lang, K., 1993. Language and economists' theories of discrimination. *International Journal of the Sociology of Language*, pp.165-183.

Lincoln, J.R. and Miller, J., 1979. Work and friendship ties in organizations: A comparative analysis of relation networks. *Administrative science quarterly*, pp.181-199.

Maume Jr, D.J., 1999. Glass ceilings and glass escalators: Occupational segregation and race and sex differences in managerial promotions. *Work and Occupations*, *26*(4), pp.483-509.

Montgomery, J.D., 1991. Social networks and labor-market outcomes: Toward an economic analysis. *The American economic review*, *81*(5), pp.1408-1418.

Morrison, A.M., White, R.P. and Van Velsor, E., 1992. *Breaking the glass ceiling: Can women reach the top of America's largest corporations?*. Basic Books.

Mun, E., 2010. Sex typing of jobs in hiring: Evidence from Japan. *Social forces*, *88*(5), pp.1999-2026.

Padavic, Irene, and Barbara F. Reskin. *Women and men at work*. Pine Forge Press, 2002.

Perna, L.W., 2001. The relationship between family responsibilities and employment status among college and university faculty. *The Journal of Higher Education*, *72*(5), pp.584-611.

Phelps, E.S., 1972. The statistical theory of racism and sexism. *The american economic review*, *62*(4), pp.659-661.

Reskin, B.F. and Hartmann, H.I., 1986. Women's Work, Men's Work: Sex Segregation on the Job. Committee on Women's Employment and Related Social Issues, National Research Council.

Schein, V.E., 1973. The relationship between sex role stereotypes and requisite management characteristics. *Journal of applied psychology*, *57*(2), p.95.

Schein, V.E., 1975. Relationships between sex role stereotypes and requisite management characteristics among female managers. *Journal of applied psychology*, *60*(3), p.340.

Smith, R.A., 2002. Race, gender, and authority in the workplace: Theory and research. *Annual Review of Sociology*, *28*(1), pp.509-542.

Weber, M., 1978. *Economy and society: An outline of interpretive sociology*. Univ of California Press.

Williams, C.L., 1989. *Gender differences at work: Women and men in non-traditional occupations*. Univ of California Press.

Williams, C.L., 1992. The glass escalator: Hidden advantages for men in the "female" professions. *Social problems*, *39*(3), pp.253-267.

Wright, E.O., 1989. The comparative project on class structure and class consciousness: An overview. *Acta Sociologica*, *32*(1), pp.3-22.