

# Research on the Influence of Female Executives' Salary Gap

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**Abstract**—This paper takes the A-share listed companies in Shanghai and Shenzhen stock exchanges from 2008 to 2017 as the research objects, and studies the reasons for the difference in the salary of different female executive positions. It shows that the companies need to employ a certain female senior staff, instead of giving them actual authority to work because of laws and regulations. Meanwhile, there are some internal reasons such as the level of female executives themselves, their age and their level of education. Further, the study provides suggestions for researchers, companies and women managers.

**Keywords**—Female executives; Pay gap; Cause analysis

## I. INTRODUCTION

It is worth studying the question of whether there is a significant difference in the compensation level of male and female executives. Women are likely to start to lag behind men. Over time, the pay gap between men and women will be wider. But there is also a gap in the pay of female executives. However, there are few studies on the pay gap between different categories of executive women. This paper will conduct relevant studies from the perspective of the female executive's level, age and education level.

## II. RELATED THEORIES AND LITERATURE REVIEW

### A. Related Theories

The role of female executives in corporate governance is currently getting a lot of attention in the literature. Among them, the impact on corporate performance has become a research focus. On the whole, domestic studies have concluded that female executive participation has a positive effect on corporate performance. At the same time, there are three viewpoints in foreign literature, which are positive correlation, negative correlation and no correlation. In addition, the various roles played by female executives in various aspects of

corporate governance are also getting more attention. For example, in view of the widely recognized positive role of female executives in corporate governance, scholars have begun to try to introduce the perspective of female executives' participation into the formation mechanism of the pay gap within enterprises. Female executives have more robust investment and merger strategies than their male counterparts. Ms. Yuan's research, for example, has found that female board participation can narrow the pay gap within executive teams. However, existing studies have the following defects. First, the definition of the intra-company pay gap is too single, focusing only on the intra-executive team pay gap or the executive-employee pay gap, and few kinds of literature use the same sample system to investigate the difference in female executive pay. Second, the research samples focus on capital-intensive or labor-intensive enterprises, lacking the focus on knowledge-based enterprises. Pucheta-Martínez (2014) studied the income data of boards of directors of companies listed on the Madrid stock exchange from 2004 to 2011, and concluded that in financial and real estate service companies, those women with degrees as independent boards of directors can contribute to the decline of the gender income gap. In nominating compensation committees, the older senior female executives are, the more likely they are to reduce the gender pay gap, which will widen with the woman. In view of this, this paper studies the reasons for the impact of the female executive pay gap and makes a comparative analysis. [10]

### B. Literature Review

Different scholars have done relevant research. The gender pay gap is also affected by differences in corporate pay systems, corporate's loyalty, the proportion of female executives, the proportion of women on boards, the proportion of women in positions, trade unions and corporate governance structures. Relevant studies are listed in the following table

TABLE I. EXISTING STUDIES

| AUTHOR | YEAR | CONTENT   |
|--------|------|---|
| FIRTH  | 2006 | It is also proposed that the practice of corporate compensation system in China is rather opaque and there is the possibility of perception bias.   |
| GHOSH  | 2006 | The study found that CEO pay in India has less to do with corporate performance and more to do with a leader's "corporate loyalty," which is often subjective and self-determined by the evaluator. |
| SHIN   | 2012 | The gender pay gap is related to the proportion of female executives, and the higher the proportion of female executives, the smaller the gender pay gap.   |
| KAHN   | 2015 | Studies on the impact of labor unions on the gender pay gap have also drawn the attention of other scholars.  |

|                                   |            |  |
|-----------------------------------|------------|--|
| <b>PENG</b>                       | 2015       | It argues that these changes have led to uncertainty and a lack of transparency in executive pay. In economic development, the process of determining executive compensation is often not standardized.  |
| <b>ABDULLAH, LUO</b>              | 2016, 2017 | Having studied the weak corporate governance structure in China, the concept of inconsistent roles is more likely to have a negative impact on female executives in China.   |
| <b>QUINTANA-GARCÍA&amp;ELVIRA</b> | 2017       | A study of longitudinal data from high-tech public companies in the United States from 2006 to 2011 found that, in order to lower the pay of male colleagues and thus reduce the gender pay gap, the presence of women at the highest levels of management, including CEOs, increased the pay of women hired from outside the company. |
| <b>CARTERETAL</b>                 | 2017       | An analysis of data from standard & poor's 1,500 companies between 1996 and 2001 found that the gender pay gap was lower in companies with a higher proportion of women on the board.  |
| <b>FORTINETAL</b>                 | 2017       | In countries such as Canada, Sweden and the UK, women's low representation in senior positions is the biggest contributor to the pay gap, according to the study.  |
| <b>MUTLU</b>                      | 2018       | China is undergoing institutional changes in terms of market competition and corporate governance.   |

### III. ANALYSIS ON THE CURRENT SITUATION OF FEMALE EXECUTIVE COMPENSATION

#### A. The number of female executives has changed

TABLE II. ANNUAL HEAD COUNT

| Year | The annual number | Percentage  | Cumulative number |
|------|-------------------|-------------|-------------------|
| 2008 | 4219              | 0.052867024 | 0.052867024       |
| 2009 | 4711              | 0.059032129 | 0.111899153       |
| 2010 | 5798              | 0.072653    | 0.184552153       |
| 2011 | 6929              | 0.086825222 | 0.271377375       |
| 2012 | 7700              | 0.096486392 | 0.367863766       |
| 2013 | 8132              | 0.101899654 | 0.46976342        |
| 2014 | 8884              | 0.111322741 | 0.581086161       |
| 2015 | 9713              | 0.121710691 | 0.702796852       |
| 2016 | 11038             | 0.138313869 | 0.841110721       |
| 2017 | 12680             | 0.158889279 | 1                 |

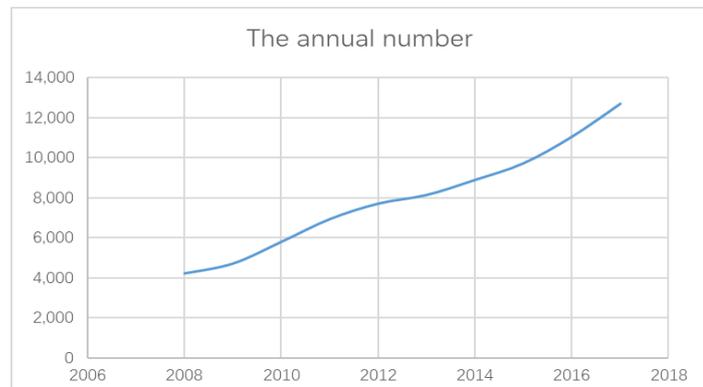


Fig.1. The annual number of chart

From 2008 to 2017, according to the CSMAR database, the number of senior female managers employed by listed companies has been on the rise. In this paper, A-share listed companies in Shanghai and Shenzhen stock exchanges from 2008 to 2017 are taken as research objects, and samples are screened according to the following principles concerning research practices: (1) listed companies in the financial and insurance industry are excluded;(2) excluding the listed companies with special transaction status such as PT, ST and \*ST;(3) excluding companies whose net assets are less than 0;(4) excluding listed companies in that year; (5) eliminating the company without core data. Eventually won the 24487 (1,602 observations in 2008, 1,692 observations in 2009, 2,040 observations in 2010, 2,317 observations in 2011, 2,470 observations in 2012, 2,468 observations in 2013, 2,591 observations in 2014, 2,808 observations in 2015, 3,032

observations in 2016 and 3,467 observations in 2017), the sample observations, in order to avoid the possible impact of extreme value, this paper deals with all continuous variables 1% Winsorize shrinkage end processing. All of the data is from the CSMAR database. From 2008 to 2017, the number of senior managers employed by public companies tripled.

#### B. Differences in executive pay for women

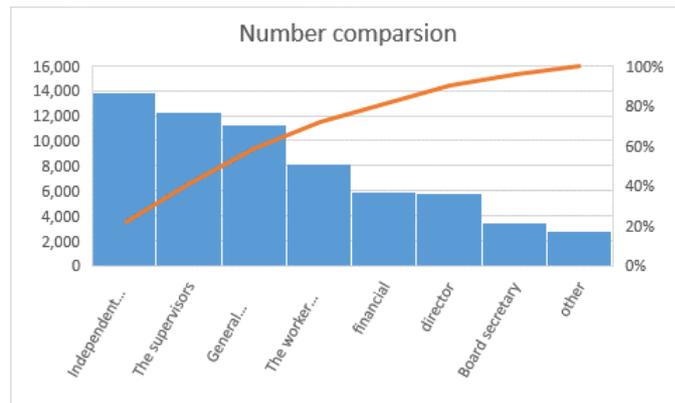


Fig.2. Different job maps

Excluding the missing value of senior management positions, 80,123 observable values were left. Among all positions, the independent directors accounted for the largest proportion, followed by supervisors, then general and deputy general managers and employees' supervisors, and finally finance, director, secretary to the President, and other positions.

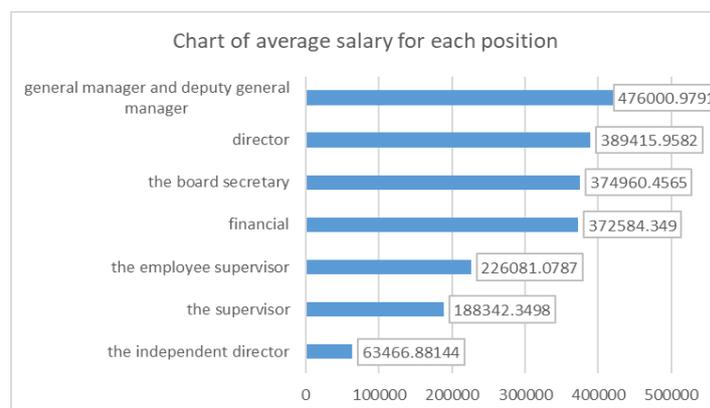


Fig.3. Chart of the average salary for each position

Director, supervisor, secretary of the board of directors, employee supervisor, general and deputy general managers, independent directors, finance, and female executives have the

highest average salary of general manager and deputy general manager. The lowest is the independent director.

*C. Differences in compensation for female executives at different ages*

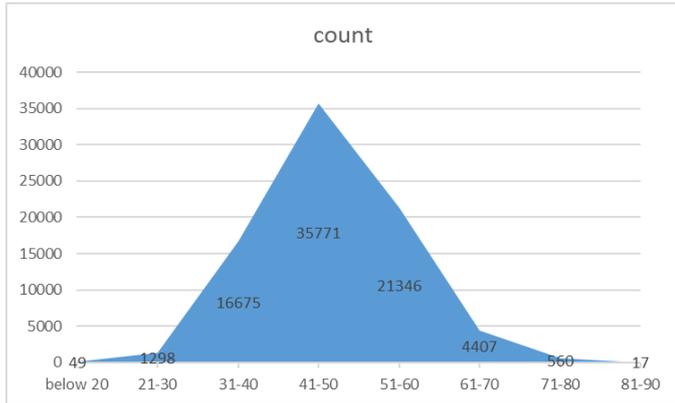


Fig.4. Chart of female executive age distribution

The number of female executives is mainly concentrated in the 31-60 age group. Converting the data in the graph into percentages, 21 percent in the 31-40 age group, 45 percent in the 41-50 age group and 27 percent in the 51-60 age group. The rest of the age group accounts for 7 percent.

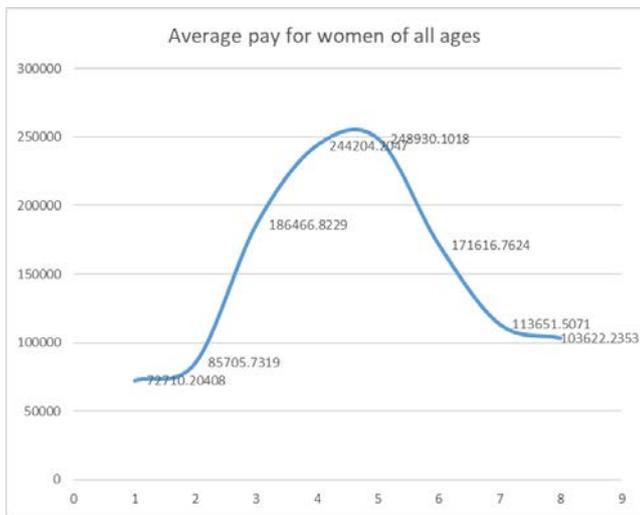


Fig.5. Chart of average executive pay for women of different ages

Abscissa 1 represents less than 20 years old female executives, 2 for 21-30 years old female executives, 3 (31-40) of female executives, 4 represent the female executives of 41 to 50 years old, 5 representatives 51 to 60 years old female executives, 6 on behalf of 61-70 - year - old female executives, 7 on behalf of the 71-80 - year - old female executives, 8 on behalf of 81-90 - year - old female executives. Can be seen from the chart in different age groups of female executives the inverted u-shaped trend is presented, including 41 to 50 years old female executives and 51 to 60 years old female executives average wage is higher. Female executives younger than 20 and older than 80 are paid less, which may be why companies

are paid less even if they are willing to hire younger or older women.

*D. Differences in compensation for female executives with different levels of education*

Data on 57,271 female executives were obtained by removing 22,852 missing values with no clear level of education.

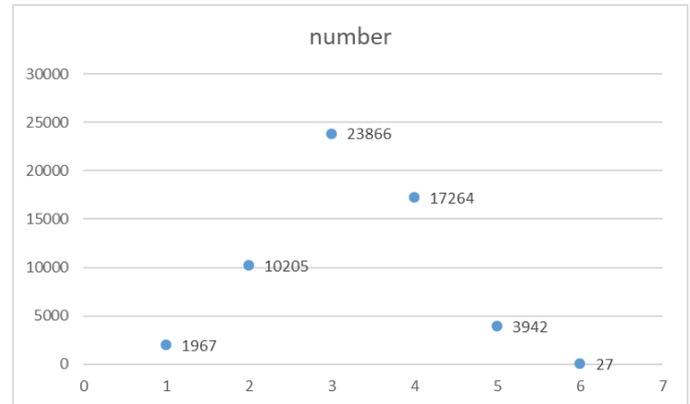


Fig.6. The number of people with different education levels

Among female managers of different educational levels, the highest number of executives received undergraduate education, followed by master's degree, then junior college, technical secondary school and below, and doctor's degree.

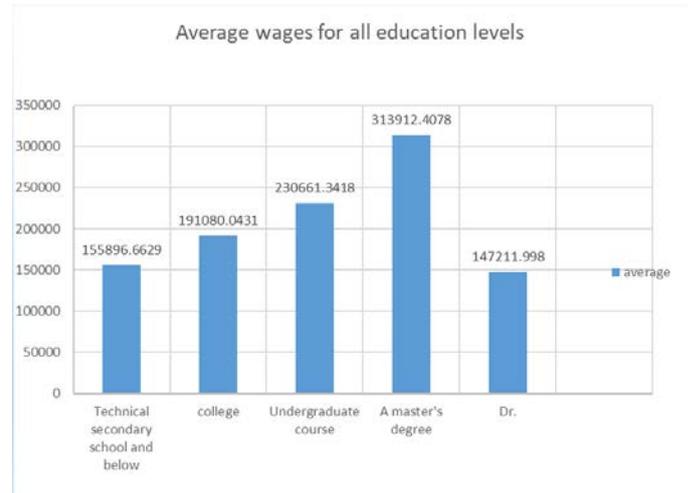


Fig.7. Average wages by education level

In the chart, it is clear that female executives with a master's degree in education receive the most optimistic pay, perhaps because some companies are more willing to hire women with a master's degree at a higher salary. Women can use this as a basis for choosing their level of education.

#### IV. ANALYSIS OF THE REASONS FOR THE FEMALE EXECUTIVE PAY GAP

Based on the analysis of the current situation of female executive compensation in the previous chapter, the causes will be analyzed based on the actual situation.

##### A. For Policy Reasons

For policy reasons, companies need to hire a certain percentage of women at the top, rather than real value women's work to meet the policy requirements. In terms of corporate personnel allocation, Norway, France, Spain, Germany, Iceland and other countries have successively introduced the quota system for female directors, requiring that women must occupy a certain proportion of board seats. Due to the continuous improvement of women's quality and the government call or mandatory requirements, the proportion of female executives in companies is increasing.

TABLE III. TABLE OF THE PROPORTION OF FEMALE DIRECTORS AND SENIOR EXECUTIVES IN SOME COUNTRIES

| Country   | year | Percentage  | remark   |
|-----------|------|---|--|
| Norwegian | 2003 | Women make up 7% of directors                           | It then grew to 44.2 percent   |
| Swiss     | 2011 | Women make up 23% of directors                          |  |
| British   | 2011 | Women make up 24.7% of directors                        |  |
| China     | 2015 | Women make up 30 percent of senior executives           | The data comes from a survey released in 2016 by accounting firm Zhitong |
| Global    | 2017 | Women make up 25 percent of global corporate executives | Accounting firm Zhitong  |

According to the table, the proportion of female directors has changed over the past few years. More women have taken an active part in business activities, and the gender diversity of senior executives has attracted more and more attention.

##### B. Female Executives Vary in Rank, Age and Education

TABLE IV. SAMPLE DISTRIBUTION DESCRIPTION

| Variable  | obs   | mean     | Std. Dev. | Min  | Max      |
|-----------|-------|----------|-----------|------|----------|
| salary    | 79164 | 228575.6 | 417575    | 0    | 1.57E+07 |
| year      | 80123 | 2013.435 | 2.762007  | 2008 | 2018     |
| position  | 80123 | 3.581406 | 2.167598  | 0    | 7        |
| education | 57271 | 3.193641 | 0.926875  | 1    | 6        |
| age       | 80074 | 46.03868 | 8.458229  | 20   | 85       |

The correlation between the ranks of female executives themselves, their age, and their education level on the pay

For data processing, salary1 is equal to salary minus mean(mean), divided by STD (standard deviation), the formula is as follows:  $salary = (salary - mean) / Std$

TABLE V. REGRESSION ANALYSIS

| salary1            | Coef.   | St.Er.     | t-value              | p-value | [95% Conf | Interval] | Sig        |
|--------------------|---------|------------|----------------------|---------|-----------|-----------|------------|
| age1               | 0.036   | 0.005      | 7.58                 | 0.000   | 0.026     | 0.045     | ***        |
| director           | -0.021  | 0.002      | -10.51               | 0.000   | -0.025    | -0.017    | ***        |
| year               | 0.036   | 0.002      | 23.25                | 0.000   | 0.033     | 0.039     | ***        |
| educ               | 0.070   | 0.005      | 15.00                | 0.000   | 0.060     | 0.079     | ***        |
| Constant           | -73.321 | 3.141      | -23.34               | 0.000   | -79.478   | -67.165   | ***        |
| Mean dependent var |         | 0.036      | SD dependent var     |         |           |           | 1.016      |
| R-squared          |         | 0.016      | Number of obs        |         |           |           | 56556.000  |
| F-test             |         | 230.401    | Prob > F             |         |           |           | 0.000      |
| Akaike crit. (AIC) |         | 161399.788 | Bayesian crit. (BIC) |         |           |           | 161444.503 |

\*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$

We use data software called stata, analyzing the correlation between female salary and the age, position, year and education level of female executives.

Salary is the dependent variable, and age1, director, year and education are the independent variables.

$$Salary = a + \alpha age1 + \beta director + \gamma year + \delta education + b \quad (1)$$

From the results of the analysis, the large absolute value of T value is used to measure the degree of relevant influence, and the age (age1) T value is 7.58, indicating a significant positive influence. The size of director T is 10.51, which is a negative influence. The T value of the year is 23.25, which is a positive influence. Education (Educ) degree T value 15 is a positive impact.

#### V. RECOMMENDATIONS FOR CLOSING THE PAY GAP FOR FEMALE EXECUTIVES

There are many reasons for the female executive pay gap, including age, length of service and educational background, as well as the company's employment preference, even social environment, government and industry policies and relevant measures. From the perspective of female management, the company, and the government, corresponding opinions or suggestions are as below.

##### A. For the Women Themselves

Women can use these tips to avoid social stereotypes that affect their potential salary opportunities.

###### 1) Getting the Right Education

Among female managers of different educational levels, the highest number of executives receive undergraduate education, followed by a master's degree. In the chart, it is clear that female executives with a master's degree in education receive the most optimistic pay. On the one hand, women should have a better educational background. At least they should have a bachelor's degree and even better, they should get a master's degree.

###### 2) Taking an Active Part in the Competition

You can see this in the age chart, female executives of all ages show an inverted u-shaped trend. Female executives aged 41 to 50 and 51 to 60 have higher average salaries. In the company, you should show your ambition and talent. By participating in the internal competition of the company, you can accumulate experience and become a professional. Only

after you have worked for a long time, the top management of the company will trust and be willing to recruit you and pay enough salary.

### 3) *Choosing the Right Position*

Director, supervisor, secretary of the board of directors, employee supervisor, general and deputy general managers, independent directors, finance, and female executives have the highest average salary of general and deputy general managers. The lowest is the independent director. When women choose senior management positions, they should fully combine reality and choose positions that they are qualified for and can obtain a high salary.

### B. *For the Company*

The key is to establish a sound system. The company needs to establish a sound compensation system and employee incentive mechanism to protect the rights and interests of employees and to stimulate the work enthusiasm of female managers. Building system of compensation for participation and communication, and enhancing transparency compensation and incentive compensation design work are complex and systematic. The company should fully understand the employees' feelings, listen to your employees, attract employees to participate in, increase staff for the new compensation system recognition, realize fairness and satisfaction, and let employees feel full of confidence. The transparent compensation system tells people that the company's system is open and fair. People with high salary have sufficient reasons, while those with low salary have their shortcomings. At the same time, if you want to get a high salary, you must look up to the role model, so as to play its due salary. The female executives with appropriate education should be selected reasonably, and appropriate positions should be allocated according to the actual job demand, so as to give full play to the value of female executives.

### C. *For the Public and the Government*

The government has been invisible hand and occupies a very important role in business development, establishing and improving the "female worker labor protection special provisions". The pursuit of social and legal aspects of gender diversity can make stronger enterprise diversification demand, help women get reasonable compensation; provide a powerful guarantee for female executives in the workforce. We will encourage more women to participate in the work of senior executives, so that they can get paid for their work and become more motivated to work. Women, improve the employment system of enterprises and resolutely put an end to gender discrimination.

## VI. CONCLUSION

The level, age and education level of female executives correlate with executive compensation income. This paper has the following conclusions.

1. From 2008 to 2017, the number of senior managers employed by public companies tripled. The number of women in senior positions is increasing.

2. Director, supervisor, secretary of the board of directors, employee supervisor, general and deputy general manager, independent director, finance, female senior managers have the highest average salary and the lowest is an independent director.

3. It is clear that female executives with a master's degree in education earn the most optimistic salaries, possibly because some companies are more willing to hire women with a master's degree at a higher salary.

The results of the study have certain enlightening significance for the practice of female participation in corporate governance. First, the significance of female executives' participation in corporate governance, spare no effort to build platforms and environments and fully develop and utilize the heterogeneous human capital and social capital network characteristics of female executives.

In addition, when women participate in company management, they should fully combine their reality and take into account their educational background, working-age and relevant positions. Female executives themselves, on the one hand, should take an active part in all kinds of corporate governance decisions, never give up. On the other hand, women should give full play to the uniqueness and decision-making perspective of women, devote themselves to enterprise decision-making according to the educational background, length of service, competence and other conditions of female managers, and maintain the inherent equity preference and personal preference of women.

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