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## Job Mobility, Gender Composition, and Wage Growth

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JOB MOBILITY, GENDER COMPOSITION, AND WAGE GROWTH

A Thesis Presented

by

YOUNGJOON BAE

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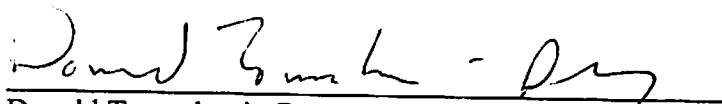
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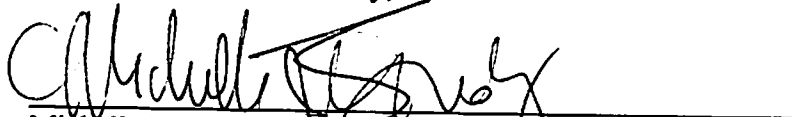
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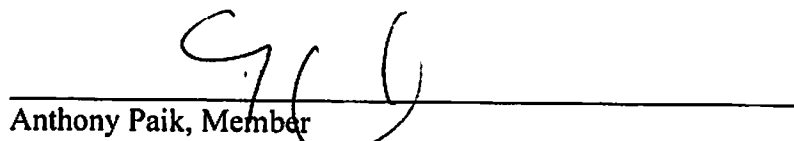
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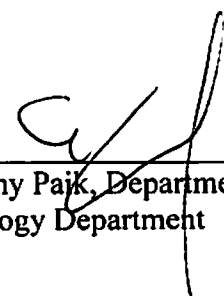
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## ABSTRACT

JOB MOBILITY, GENDER COMPOSITION, AND WAGE GROWTH

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To explain the gender wage growth gap, sociologists tend to focus on gender segregation among/within jobs whereas economists put emphasis on individual job mobility. This study adopted a concept combining both segregation and mobility. The concept helps to take the gender segregation before and after job mobility into account to strictly measure the mechanisms of wage growth. For analysis, this study used 6-year personnel data of a firm, which allows researchers to track employees' job mobility, wages, and job information at the most accurate level. The concept of combining segregation and mobility was operated through the gender composition of jobs and employee job change, which generated ten patterns. Among them, the following six were focused: staying in male or female jobs, movement between male or female jobs, and movement toward male or female jobs. While controlling wages at prior jobs, the multilevel model analysis shows that the wage growth rates in the six mobility patterns were stratified as follows: mobility between male jobs, stay in male jobs, mobility toward male jobs, mobility toward female jobs, mobility between female jobs, and stay in female jobs. This hierarchy system in the organization reveals two features: first, men's job-related mobility or stay compensated more steeply than women's job-related mobility or

stay. Second, within each gender category of jobs, the mobility provided higher wage growth than stay. In sum, the gender category of jobs proceeded job mobility in terms of wage growth. Interestingly, when paying attention to the higher wage growth of ‘mobility toward female jobs’ than ‘mobility between female jobs’, this implies that the former occurred in movement from lower-level male jobs to higher-level female jobs, particularly higher than female jobs involved in the latter mobility. In view of gender regarding job mobility patterns, women and men typically did not experience differentiated salary growth. The categories of job mobility used in this paper provide a new and integrated insight for scholars who study gender segregation and job mobility, especially in view of an organization.

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## CHAPTER 1

### INTRODUCTION

The gender wage gap has been a controversial issue, especially as women's and men's human capital has converged. The figure seems evident. The commonly cited measure of the gap is that women earn 80 cents for every dollar earned by a man. Meanwhile, typically, women and men do not experience the significant gender wage gap at the entry stage. Even though it is sometimes significant, the gap becomes much larger over time. Thus, one key to the gender wage gap is to examine the mechanisms of wage growth. Generally, many labor economists understand the growth gap by gender as disappeared when accounting for job mobility. On the contrary, most sociologists argue that the gap is still significant when considering gender segregation. Both groups tended to study the same topic through their respective lenses.

This paper utilizes a concept of categorical changes in the gender composition of jobs by employee job movements. The concept captures both mobility through employee job movements and gender segregation via the gender composition of jobs. While controlling for wages at prior jobs, wage growths in the following six categories are emphasized and compared: staying in male or female jobs, movement between male or female jobs, and movement toward male or female jobs. Furthermore, the gender effect on the six patterns is tested by interaction terms. To be sure, this kind of examination should include factors indicating association with wage growth. Unfortunately, they are many, hence it is hard to find a data set with all of them. Instead, this paper takes a strategy of using a data set to track employee mobility, job information, and wages at the most accurate level. For this, personnel records of a firm over time in the U.S. were employed and the integrated approach of mobility and gender segregation were tested.

## CHAPTER II

### LITERATURE REVIEW

#### A. When Does the Gender Wage Gap Become Apparent?

Before discussing the gender wage growth gap, it is important to first understand the gender wage gap, especially its occurrence and peak. If significant and sizable gender wage gap is detected at the initial point, the growth gap may not be a factor for consideration of the gender wage gap. However, men and women tend to start their careers with similar wages (Loprest 1992; Manning and Swaffield 2008). This is because workers are likely to have the least accumulation of work experience in their early careers. Therefore, women and men may not see a huge gap in their wages at this stage, even among various occupations. This would be even more the case for jobs with fewer required qualifications. The wage gap should become apparent only over time.

The gender pay gap increases rapidly during the early careers and is likely to stagnate after reaching its peak. However, there is no consensus on the peak timing of the gender pay gap. It likely will vary by industry, occupation, and establishment. Many observed the first four years of experience (Alon and Tienda 2005; Loprest 1992), and others adopted the first ten years for a more conservative application (Del Bono and Vuri 2011; Manning and Swaffield 2008; Topel and Ward 1992).

#### B. Potential Mechanisms of Gender Wage Growth Gap in the Workplace

##### 1. Human capital

There are various reasons for the differential wage growth between women and men. The difference in human capital has been argued by economists to be a major reason. However, sociologists and, more recently, economists have shown that it accounts for a small and declining part of the gender wage growth gap (England 1982; England et

al. 1988; Goldin 2014; Okamoto and England 1999; Tomaskovic-Devey 1993). In fact, the difference in human capital between women and men has diminished; education has converged, experience has also converged, and only tenure with the same employer remains different. Although there is no information regarding education in the dataset for this study, it is assumed that the educational difference among employees is likely to be less significant in the manual labor workplace, and the difference would not play an important role in the performance of their tasks.

## **2. Initial job assignment as segregation**

Segregation means “the concentration of women and men in different jobs” (Reskin 1993). For careers in an internal labor market, segregation can occur in two processes. One way is through an initial job assignment, and the other is by means of women’s and men’s mobility to more gender-segregated jobs. Both processes will be reviewed more in the segregated job ladders section along with consideration on mobility. The literature on segregation for the initial job assignment explains that women work in women’s jobs offering lower wage growth than men’s jobs (Bukodi and Dex 2010; Marini and Fan 1997; Ransom and Oaxaca 2005). Therefore, as indicated by Loprest (1992) and Manning and Swaffiled (2008), women and men are likely to experience the gender wage gap in their initially assigned jobs over time although they may start at similar wages at the entry point. Thus, according to the notion, *stayers in male jobs are likely to gain steeper wage growth than stayers in female jobs* (Hypothesis 1).

## **3. Mobility<sup>1</sup>**

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<sup>1</sup> In many studies, mobility is referred to as employer change. This study examines job movement within a firm. Thus, the context may be different. However, employees within each job tended to be paid with similar wages, which means that promotion was not the main mechanism for wage growth in this firm.

Labor economists tend to stress mobility as the underlying reason for the differential wage growth between women and men (Keith and McWilliams 1995, 1997; Loprest 1992). This line of study argues that most employees do not stay in one job. To obtain better wages, they need to change jobs (Rosenfeld 1992). Loprest (1992) argued that men's wage growth in the first four years after entering the labor market is higher than women's, and the reason is that men have more frequent job movement. Controlling for differences in mobility, she found that women and men show similar wage growth. Keith and McWilliams (1995, 1997) made a further assertion. That is, they found that even more elaborated reasons for the difference between women and men in the mobility (i.e., family-related quitting for women and discharge for men) do not explain the gender wage growth gap. Women's quitting for family-related reasons was not penalized more than men's discharge. According to these scholars, only mobility in itself matters, and its gender or gender-based context do not matter. In other words, they understand that wage growth is an outcome of gender-neutral mobility.

Although some sociologists also discuss the effect of mobility, they tend to delve into its contexts, particularly the gender difference in mobility (Cha 2014; Fernandez-Mateo 2009; Fuller 2008). Fuller's study (2008) directly disputes Keith and McWilliams' finding. Fuller explains that married women experienced less favorable mobility, and this ended up with lower wages. Cha (2014) compared earnings growth between women and men after leaving firms with two types of mobility: quitting and layoffs. After quitting as voluntary, women earned more than men, but this was led by childless women. On the

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Instead, job change was a factor. In this sense, studies on mobility were reviewed.

contrary, layoffs as involuntary caused women to earn less than men. Unlike the labor economists' arguments, the consequences of mobility on wages growth seem differential between women and men when contexts are considered.

One of the strong arguments from labor economists is that men are likely to invest their resources in their firms in the long-term. Therefore, they can accumulate firm-specific skills, which may be the reason employers pay men more. On the contrary, women's lower wages have been justified to be due to their intermittent careers (Mincer and Jovanovic 1981; Royalty 1998). However, contract employment typically does not demand a high level of firm-specific skills, and intermittent employment is widespread. Fernandez-Mateo (2009) investigated high-skill contractors in employment to refute the idea of accumulated firm-specific skills as a source of men's higher pay. In the context, women's movement with similar tenure and client transitions were rewarded lower than men's movements. Therefore, there was differential compensation by gender, but the study also reports women's lower rates of movement across clients as the other source of the gender wage growth gap, as pointed out by Loprest (1992). In short, there is no consensus regarding mobility effects on wage growth by gender especially, when considering the contexts of mobility. This paper restricts mobility to within-firm mobility controlling the context effect in external mobility. Even with this procedure, there would still remain gender-differential contexts in internal mobility. Based on this, men's mobility is likely to obtain higher wage growth than women's mobility. This would be same at the aggregate level (Please refer to the Segregated job ladders section for detailed explanation). Thus, *mobility between male jobs is likely to pay higher growth rate than mobility between female jobs* (Hypothesis 2).

#### **4. Mobility in the vacancy chain model**

According to the vacancy chain model, mobility is a zero-sum game (Chase 1991). Without an incumbents' retirement or the new creation of jobs, employee job movement is not possible. For instance, if an employee leaves her/his job, it is likely to be occupied by a worker from a lower rank within the organization. This change continues to the next rank of workers until the last job is filled, abandoned, or merged. The lowest level of positions would be taken up by new employees from outside the firm. Based on this perspective, women's mobility to male jobs can be investigated systematically by considering mobility between ranks in a firm. For example, assume that a male-dominated job in an upper position has a vacancy. This job is likely to be filled by an employee from another male-dominated job. A male employee may be given priority for the position. On the contrary, a female employee, particularly if she moves from a female job, may not take the position although the woman's rank in position is similar to the man's rank regarding wages. The employers or personnel staffs are likely to justify this devaluation process of women's eligibility to the position by arguing that women need a training period to work in male jobs. This assumption may be applied to an aggregated level. That is, when female jobs are equivalent to male jobs in terms of wages, employee movement to male jobs from female jobs will be likely to provide lower wage growth than movement from male jobs. This is rephrased as *mobility toward male jobs will be likely to provide lower wage growth than mobility between male jobs* (Hypothesis 3a). Similarly, this hierarchy system by the gender composition of jobs will exist among female jobs. When female jobs are equivalent to male jobs in terms of wages, employee movement to female jobs from female jobs will be likely to provide lower wage growth than movement from male jobs. This is rephrased as *mobility between female jobs will be*

*likely to provide lower wage growth than mobility toward female jobs* (Hypothesis 3b).

### **5. Segregated job ladders**

A group of sociologists and scholars with organizational theories have examined women's and men's mobility in view of segregation by studying patterns of job ladders (Baron, Davis-Blake, and Bielby 1986; Bukodi and Dex 2010; DiPrete and Soule 1988). They pay attention to women's and men's distinctive career routes, not as individuals but as a collective outcome by gender. The different paths may originate from distinctive initial job assignments (Ransom and Oaxaca 2005). Bukodi and Dex (2010) contrasted how differently a bad start in an initial job assignment impacts women's and men's mobility. They described women's low-level entry jobs as a trap, whereas men's bad jobs as a stepping stone to better paying jobs. Women who entered the labor market in low-level jobs were not able to fully offset their initial disadvantages by subsequent career advancement. On the contrary, their male counterparts used the initial period as an investment in human capital or as an experiment to find the most profitable position. Similarly, Dohmen and colleagues (2004) stressed the important role of stepping-stone jobs by describing them as a preliminary process to land male employees softly in upward transitions.

Gender segregation may occur through job change without accompanying segregation at entry points. Baron and colleagues (1986) observed how employees in gender-integrated (balanced) jobs changed their jobs over time. Those gender-integrated jobs included 30–70% of female employees. The result showed that only 17% maintained the prior category by movement. Meanwhile, 73% moved to all-male jobs, and this movement was executed by only men. On the contrary, 10% of the job changers moved

from gender-integrated jobs to all-female jobs, and these movers were all women. This result shows that job mobility can solidify gender segregation in jobs. As labor economists assert, mobility may matter for wage growth (Keith and McWilliams 1997, 1999; Loprest 1992). However, the outcome by mobility can also be influenced by gender and collectively, gender composition of jobs. That is, even women who change jobs may encounter fewer wage returns than men because women's movement is likely to be limited to female jobs.

Men's job ladders tend to be connected to upper-level jobs, such as managerial positions, where steeper wage growth is expected. DiPrete and Soule (1988) reported that significant gender differences in job mobility occurred, particularly when employees changed their jobs from the lower-tier to the upper-tier<sup>2</sup>. It is not different from the glass ceiling indicating women's unofficial barrier to advancement. However, more importantly, they also presented job-ladder grouping as an underlying structure regarding mobility. If the job ladders are segregated as female ladders and male ladders, women's mobility may not have an expected wage growth. In the end, the wages growth associated with climbing a career ladder in female jobs will be flatter relative to the same number of ladder rungs in male jobs (This is the same idea with Hypothesis 2). For wage growth equal to men's growth, women need to jump to men's job ladders (Dohmen et al. 2004).

## **6. Women in male jobs: isolation, devaluing, and leaving vs. Women in male-job mobility**

Although the gendered mobility based on job segregation helps to understand

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<sup>2</sup> DiPrete and Soule (1988) employed Stewman and Konda's formula to calculate the multiple-grade ratio. Refer to the formula for a detailed explanation of the division between lower-tier grades and upper-tier grades.



women's lower wages in the workplace, this does not correctly respond to a criticism that the segregation may be women's voluntary choices rather than a coercive outcome.

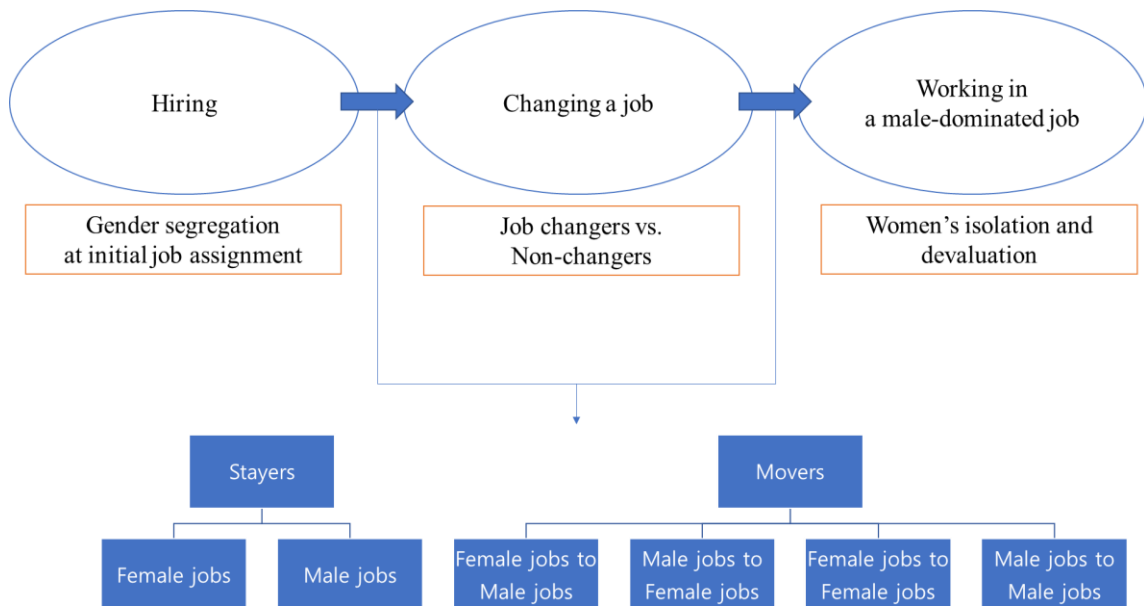
Women in male jobs would be an important group to answer the argument through comparing their wage growth to their male counterpart's wage growth. Some studies addressed that after penetrating into traditionally male jobs, women tend to confront unfavorable conditions such as isolation from cooperation and devaluing of their work (Cohen and Huffman 2003; Levine 2009; Spilerman and Petersen 1999). Budig (2002) compared women's and men's wages and wage growth in female-dominated, male-dominated, and balanced occupations. She found that men had advantages in all three categories. Many women in male jobs returned to female jobs although the male jobs offered more opportunistic paths (Jacobs 1989). A greater proportion of women in male jobs left their jobs than women in female job or men in male or female jobs (Maume 1999). Meanwhile, there is no evidence how women who stay in male jobs or move between male jobs experience wage growth comparing to their male counterparts. Based on the hostile condition to women, the following two hypotheses were constructed.

*Women are likely to gain additionally lower wage growth than men when both stay in male jobs (Hypothesis 4a). Women are likely to gain additionally lower wage growth than men when both move between male jobs (Hypothesis 4b).*

Figure 1 shows three locations generating the gender wage growth gap in the internal labor market and indicates the arena of this study. After hiring, women may first encounter differentiated wages growth from men by initial job assignment. In the second stage, the wage growth gap may stem from whether employees change jobs or not as some labor economists argue. However, as some sociologists refute it as a

decontextualized individual choice, women or female jobs may experience lower wage growth. Such differential wage growth may remain even when women work in male jobs. Instead of participating in one side, this paper examines the joint dynamics of segregation and mobility in producing wage growth. Specifically, this study compares wage growth rates in six job mobility patterns constructed by individual mobility and the gender category of jobs at prior year and current year. In addition, by using interaction terms, women’s wage growth is compared to men’s growth when both groups stayed or moved in/between male jobs.

Figure 1 Mechanisms of the gender wage growth gap in the internal labor market



## CHAPTER III

### METHODS

#### A. Data

This study uses personnel data from warehouses and small manufacturing plants owned by a single retail firm from 1992 to 1997. The raw data include employee names, ID numbers, tenure, gender, and job titles with contextual information on the organization, department, and sub-department. Personnel data are advantageous because job changes within the firm and wage changes are precisely measured. These data allow a focus on internal mobility and so conform to the notion of job ladders and vacancy chains in the theoretical accounts.

The sample is limited to employees with two or more years of employment because employees who worked only one year in the firm cannot have observed internal mobility. 1,693 employees (21%), who had only a one-year record during the observed period, were removed from 8,160 employees. Before the deletion, gender differences in quitting rates were examined because some scholars argue that the gender pay gap is the outcome of different quitting rates between women and men (Mincer and Jovanovic 1981; Royalty 1998). The result oppositely showed that men tended to quit more frequently than women, at least in their early careers.<sup>3</sup> The final sample was 6,467 employees. Some individuals were observed during the entire period, others left their

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<sup>3</sup> Appendix 1 shows quitting rates in each year by tenure and gender. Here, the tenure variable was measured as yearly-based. If an employee worked for one year in the firm, his/her tenure was coded as 0. For example, between 1992 and 1993, the quitting rate for men who had just entered the company (0 tenure) was 23%, whereas 77% of the new male employees continued to work in 1993. Conversely, the counterpart women's quitting rate was 11%. Although the pattern of quitting rates varies by year, it can be summarized roughly as follows: women showed lower quitting rates than men among entry workers who worked less than three years. Through employees with 3 to 6 years of tenure, there is no consistent gender difference in quitting. For workers with higher tenure, women's quitting rates are higher than men's rates in the firm.

workplaces early, and still others entered the firm later. In short, the dataset is unbalanced. Among the sample, 1,167 were women (18%), and 5,300 were men (82%). The firm itself is male-dominated.

The structure of job titles is complicated because there are many organizations, departments, and sub-departments, and job titles are nested in those hierarchies. Some job titles are found in several organizations, departments, and sub-departments. For example, one of the frequently observed job titles is the selector. Its main task is to sort out items in a warehouse; thus, it appears in various workplaces, such as a dairy department, a frozen foods department, or a grocery department in a warehouse. Therefore, the same job titles can have variation in wages and female percentage if they belong to other organizations, departments, or sub-departments. They were treated separately. In short, jobs were defined as the combination of information on organization, department, sub-department, and job title. Table 1 indicates the average number of employees per job. On average, 5-6 employees worked together in a job.

Table 1 The average number of employees in a job

|                     | 1992  | 1993  | 1994  | 1995  | 1996  | 1997  |
|---------------------|-------|-------|-------|-------|-------|-------|
| Total employees     | 4,196 | 4,842 | 4,959 | 5,085 | 5,194 | 4,788 |
| Jobs                | 755   | 871   | 966   | 969   | 963   | 1,025 |
| Total employees/Job | 5.6   | 5.6   | 5.1   | 5.2   | 5.4   | 4.7   |

## B. Variables

The dependent variable is workers' annual salary growth (change in salary).<sup>4</sup> This

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<sup>4</sup> Instead of using the term "wage," this paper adopts the term "salary" because it is more appropriate under the context of the data. Typically, wage means hourly, daily, or weekly compensation, whereas salary is monthly- or yearly-based compensation. In the data, employee earnings changed annually. The term "salary" is used hereafter, except for indicating the term as wage in related literature.

was calculated by subtracting in real dollars the prior year's salary from the current year's salary. The independent variable is categorical changes in the gender composition of jobs by employee job changes. The job change part was calculated via whether the former job and the current job have difference in job codes. Any changes in job title, sub-department, department, or organization were coded as 1; otherwise 0.

The measure for the gender composition of jobs is borrowed from a conventional approach (Budig 2002; Stainback and Tomaskovic-Devey 2012). Jobs including 0–30% female employees are categorized as male-dominated jobs; jobs including 31–70% female employees are categorized as gender-balanced jobs; and jobs including 71–100% female employees are categorized as female-dominated jobs. In addition, other distributions as a supplemental analysis were explored to test the robustness of the results (See Appendix 3). The test indicated that the main findings are consistent although there are some changes<sup>5</sup>.

The intersection between mobility and the gender composition of jobs at the prior job and the current job produces the core group of variables in this study<sup>6</sup>. The following explains the process of generating the set of variables. First, employees may change jobs within the same category, such as male job to male job, female job to female job, and

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<sup>5</sup> Stayers in male jobs and movers between male jobs tended to earn steeper salary growth rates than movers toward female jobs. And stayers in female jobs were likely to gain lower salary growth than movers toward female jobs. These are consistent results and indicate that stay or mobility related to male jobs were compensated with steeper rates than stay or mobility related to female jobs. However, movers between female jobs and movers toward male jobs showed inconsistent results when using the different distributions of percent female to define job categories. This seems that mobility related to female jobs might not have a strong hierarchy.

<sup>6</sup> Compared to methods used in other studies, this study considers the gender category of jobs both at the prior job and at the current job to calculate salary growth. This is to examine the category effect in view of mobility.

balanced job to balanced job. The mobility between male jobs is labeled as “mobility within male jobs.” The mobility between female jobs is labeled as “mobility within female jobs.” In the same manner, the mobility between balanced jobs as “mobility within balanced jobs.”

Second, employees may change jobs for jobs with more male workers. In this study, such a type of mobility includes movement from female job to male job, female job to balanced job, and balanced job to male job. They were named as “mobility toward male jobs.”

Third, employees may change jobs toward those with more female workers. This type includes movement from male job to female job, male job to balanced job, and balanced job to female job. They were labeled as “mobility toward female jobs.” These five kinds of mobility (mobility within male jobs, mobility within female jobs, mobility within balanced jobs, mobility toward male jobs, and mobility toward female jobs) indicate movers’ mobility patterns in this study.

Last, people may not move at all and then they are defined as stayers within the gender job type. The incumbents who stay in their male jobs were labeled as “continuity of male jobs,” whereas those who hold their prior female jobs were labeled as “continuity of female jobs.” The holders in balanced jobs were labeled as “continuity of balanced jobs.”

Although stayers are regarded as holding their gender categories of jobs, it is not always true. The case is rare, but stayers may experience a change in the gender category of jobs because of their colleagues’ mobility. Those employees who hold their jobs but

experience the change in the gender composition of jobs toward male jobs were considered. These include transitions from female jobs to male jobs, female jobs to balanced jobs, and balanced jobs to male jobs. These changes were labeled as “transition toward male jobs.”

In the similar manner, employees who hold their jobs but experience a change in the gender composition of jobs toward female jobs were considered. The change in the gender composition of jobs to more female employees, such as male jobs to female jobs, male jobs to balanced jobs, and balanced jobs to female jobs, was named “transition toward female jobs.” The distribution is reported in Appendix 2.

All these groups were coded as dummy variables. If corresponded, the value has 1. Otherwise, the value has 0. For example, if an employee holds a female job in 1992 and 1993, the person has a 1 in “continuity of female jobs” in 1993. Values in the other nine variables are coded as 0. Although mobility within balanced jobs, continuity of balanced jobs, transition toward female jobs, and transition toward male job were included in the analysis, the focus groups are mobility between male or female jobs, mobility toward male or female jobs, and continuity of male or female jobs. For the regression analysis, “mobility toward female jobs” was chosen as the reference group. However, other main groups were also tested and showed stability regarding the rank of salary growth.

There are control variables as well. Jobs with many entry workers may offer lower salaries, and similarly jobs with many quitting workers are likely to be dead-end jobs paying low salaries. To control for these processes the numbers of entry, quitting, move-in (from other jobs within the firm), and move-out (to other jobs within the firm)

were counted annually at the job level. Each was calculated by changes of members in jobs between the former year and the current year while considering their entry and destination.

The range of seniority in jobs is employed to sort some jobs, in which employees' seniorities are wide, from jobs with relatively narrow seniorities. The employees in jobs with wide seniority are likely to continue working in their jobs. On the contrary, those who work in jobs with narrow seniority may be pressured to move to other jobs if they stay there beyond a typical seniority. This variable was created by counting annually the number of different (unique) tenures in jobs. If the number is 1, this indicates that employee tenures are unitary. This is possible via a single worker or multiple workers with the same tenure.

At the individual level, time-varying variables, such as prior salary and tenure, were used. In general, salary growth rates are likely to show a steeper increase at lower salaries. Therefore, previous year's salary was added to control differential salary growth by salary level. Tenure was calculated from the total period of working, and its unit is the year. It has integer values from 2 (Again, workers with one year and below tenure were removed). "Female" indicates whether an employee's gender is female or male. If the employee is female, then the value is 1, and otherwise it is 0. At the job level, the number of employees in each job (job size) was counted. When employees belong to a job in the same year, they should share the same total employees. This variable is time-varying due to employee job mobility.

### **C. Statistical Model**

A two-level random-intercept model was employed to analyze the associations



among mobility, gender composition of jobs, and salary growth where there is a nested level of clustering; repeated observations within employees. The reason for using multilevel analysis is that observations at the lower level are likely to be similar if they are jointly selected into the upper level. For example, randomly selected annual observations on employees in a company may correlate with their salary growth, but a great portion of the correlation may be explained by belonging to the same employees. Repeated observations by year belong to level 1 of the two-level model. For simplicity, all variables were assumed as indicating only fixed effects. That is, all covariates were placed in level 1 whereas level 2 had only an intercept. However, a detailed application will be needed for more sophisticated modeling such as random-effect predictors in levels 2.

For comparison, different variables were selected, and they constructed four models. Model 1 includes the job-change variable and other control variables. This model tests the literature of labor economists who argue that wage growth depends on employee job change rather than gender. Model 2 replaces the job change variable with three gender categories of jobs: male jobs, female jobs, and balanced jobs. This model is to test the reviewed sociologists' arguments emphasizing the role of gender segregation in jobs with respect to wage growth. Model 3 replaces the three gender categories of jobs with 10-patterned mobility variables while focusing on continuity of male jobs, continuity of female jobs, mobility within male jobs, mobility within female jobs, mobility toward male jobs, and as the reference group, mobility toward female jobs. Model 3 is constructed to see the combined effect of mobility and the gender composition of jobs. Lastly, in Model 4, interaction terms are added in Model 3 to test whether the 10 mobility

patterns had separated effects by gender. The female variable was multiplied with those 10-patterned variables, respectively. The variables introduced above were nested in the two-level model as follows (all variables in the models were included):

Level-1 (year):

$$y_{ij} = \beta_0 + \beta_1 x_{1ij} + \beta_2 x_{2ij} + \beta_3 x_{3ij} + \dots + \beta_{30} x_{30ij} + e_{ij}, e_{ij} \sim N(0, \sigma^2)$$

Year:  $i$

Change in salary:  $y_{ij}$

Job change or not:  $x_{1ij}$

Male job:  $x_{2ij}$

Balanced job:  $x_{3ij}$

Move toward male jobs:  $x_{4ij}$

Move within male jobs:  $x_{5ij}$

Move within female jobs:  $x_{6ij}$

Move within balanced jobs:  $x_{7ij}$

Stay in male jobs:  $x_{8ij}$

Stay in female jobs:  $x_{9ij}$

Stay within balanced jobs:  $x_{10ij}$

Conversion toward male jobs:  $x_{11ij}$

Conversion toward female jobs:  $x_{12ij}$

Female x Move toward male jobs:  $x_{13ij}$

Female x Move within male jobs:  $x_{14ij}$

Female x Move within female jobs:  $x_{15ij}$

Female x Move within balanced jobs:  $x_{16ij}$

Female x Stay in male jobs:  $x_{17ij}$

Female x Stay in female jobs:  $x_{18ij}$

Female x Stay within balanced jobs:  $x_{19ij}$

Female x Conversion toward male jobs:  $x_{20ij}$

Female x Conversion toward female jobs:  $x_{21ij}$

Female:  $x_{22ij}$

Salary <sub>$t-1$</sub> :  $x_{23ij}$

Tenure:  $x_{24ij}$

N of entries:  $x_{25ij}$

N of exits:  $x_{26ij}$

N of move-ins:  $x_{27ij}$

N of move-outs:  $x_{28ij}$

N of different tenures:  $x_{29ij}$

Job size:  $x_{30ij}$

Level-2 (employee):

$$\pi_{0j} = \beta_{00} + \gamma_{0j}$$

$$\pi_{1j} = \beta_{10} + \gamma_{1j}$$

Employee id:  $j$

**CHAPTER IV**  
**RESULTS**

**A. Employee Job Mobility and the Gender Category of Jobs**

Table 2 shows the differences between women's and men's records on salary, salary growth, tenure, and a ratio of job changers. First, Women (\$18,574) earned 77% of men's wages (\$24,005). Unlike the literature review, there was a significant gender pay gap even at the entry stage. Women's salary growth rate by year was lower than men's rate, but the gap was not statistically significant. The salary gap might stem from women's shorter tenure or less frequent mobility. That is, women's tenure was 1.5-year shorter than men's tenure. In addition, women tended to change jobs, exactly speaking internal jobs, less frequently than men. The 0.06 or 6% gap in job mobility seems small although it is statistically significant. Meanwhile, this needs a careful examination because the job change was measured annually, but employees typically do not change their jobs every year. In fact, several studies (Alon and Tienda 2005; Fuller 2008) report that excessively frequent job changes or job changes after a job-shopping period, usually in the first four years after entry to the labor market, ended in wage penalties. Therefore, an alternative measure was tested: whether an employee changes jobs or not at least once during the observed period. Based on this approach, 62% of female employees changed their jobs whereas 76% of male employees did so. In short, women and men showed differences in tenure and internal mobility. However, the frequency of mobility might be impacted by the distribution of male jobs and female jobs. If there were many male jobs, men were likely to change jobs more easily than women.

Table 2 Mean and SD (in parentheses) of total employees who worked more than 1 year

|  | Women's | Men's | T test |
|--|---------|-------|--------|
|--|---------|-------|--------|

|                          | repeated records          | repeated records          |                              |
|--------------------------|---------------------------|---------------------------|------------------------------|
| Salary                   | \$18,574.4<br>(\$3,420.9) | \$24,004.5<br>(\$5,229.2) | significantly<br>different   |
| Salary for 2-year tenure | \$14,638.3<br>(\$2,093.6) | \$15,739.8<br>(\$2,647.0) | significantly<br>different   |
| Salary growth by year    | \$263.8<br>(\$1,235.1)    | \$295.6<br>(\$1,866.1)    | insignificantly<br>different |
| Tenure (years)           | 7.6<br>(5.8)              | 9.1<br>(6.9)              | significantly<br>different   |
| Job change or not        | 0.30<br>(0.46)            | 0.36<br>(0.48)            | significantly<br>different   |

Table 3 shows the degree of gender segregation in jobs. 77.0% of jobs are male-dominated, whereas 17.2% was female-dominated jobs during the observation period. Interestingly, among the male-dominated jobs, 90% was filled by only men and 80% of the female-dominated jobs consisted of only women. In short, the firm is an example of the male-dominated workplace and extreme gender segregation. Therefore, it is important to consider job mobility under the context of gender segregation. For example, how women's mobility is different from men's mobility when considering the female percentages of jobs?

Table 3 Job category by female percentage and the distribution of job-years observed

| Percent female | Category             | Number of jobs | Percent of the category |
|----------------|----------------------|----------------|-------------------------|
| 0% to 30%      | Male-dominated job   | 1,615          | 77.0%                   |
| 31% to 70%     | Gender-balanced job  | 121            | 5.8%                    |
| 71% to 100%    | Female-dominated job | 361            | 17.2%                   |
| Total          |                      | 2,097          | 100.0%                  |

### **B. Six Mobility Patterns by Job Mobility and the Gender Composition of Jobs**

The first two rows in Table 4 show the distribution of employees who stayed in their jobs. The majorities of women (61.4%) and men (62.9%) stayed in jobs corresponding to their gender category. In this perspective, women and men showed similar ratios. A clear distinction between women and men appears when considering the

cases of maintaining their gender categories of jobs within their opposite-gender boundaries: female stayers in male jobs (6.4%) and male stayers in female jobs (0.3%).

This gender difference also become obvious when looking at detailed mobility patterns by the gender category of jobs. 34.3% of men moved between male-dominated jobs whereas 19.9% of women moved between female-dominated jobs. Much smaller ratios in men's mobility patterns are indicated in male movers between female jobs (0.1%), toward female jobs (1.1%), or toward male jobs (1.3%), compared to their female counterparts: female movers between male jobs (2.0%), toward female jobs (5.3%), or toward male jobs (5.1%).

In sum, most men experienced the internal mobility as a conventional way in male jobs whereas women show much higher cross-gender mobility than men for each type of mobility. It may be due to the shortage of female jobs in this male-dominated workplace. As shown in Table 4, 77% of jobs were male-dominated. By random sorting, employees are more likely to move to male jobs. However, this assumes 50% women and 50% men. The sample included much more male workers (82%) than female workers (18%). Therefore, the men's concentration on stay in male jobs or mobility within male jobs or women's diversification in the mobility patterns is a noticeable outcome. In addition, according to Cohen and Huffman (2003), the women's job mobility beyond their gender boundary might be based on the devaluation of female jobs. Especially, in this extremely male-dominated workplace, women's job movement from female job to male job is likely to be regarded as a breakthrough of a barrier. In the next section, the hierarchy of the six job mobility patterns is examined.

Table 4 Job mobility category and its distribution by gender

| Former job   | Current job  | Typology                     | Men's repeated records | Women's repeated records |
|--------------|--------------|------------------------------|------------------------|--------------------------|
| Male job     | Male job     | Continuity of male jobs      | 11,383<br>(62.9%)      | 210<br>(6.4%)            |
| Female job   | Female job   | Continuity of female jobs    | 63<br>(0.3%)           | 2,015<br>(61.4%)         |
| Male job     | Male job     | Mobility between male jobs   | 6,202<br>(34.3%)       | 64<br>(2.0%)             |
| Female job   | Female job   | Mobility between female jobs | 10<br>(0.1%)           | 653<br>(19.9%)           |
| Male job     | Balanced job | Mobility toward female jobs  | 193<br>(1.1%)          | 173<br>(5.3%)            |
| Male job     | Female job   |                              |                        |                          |
| Balanced job | Female job   |                              |                        |                          |
| Balanced job | Male job     | Mobility toward male jobs    | 233<br>(1.3%)          | 167<br>(5.1%)            |
| Female job   | Male job     |                              |                        |                          |
| Female job   | Balanced job |                              |                        |                          |
| Total        |              |                              | 18,084<br>(100.0%)     | 3,282<br>(100.0%)        |

### C. A Mechanism of the Gender Salary Growth Gap:

#### Mobility in Segregated Jobs by Gender

Four models in Table 5 illustrate the associations between the salary growth variable and various predictor variables. Each model represents different theoretical backgrounds. Model 1 is based on the labor economics literature; thus, it was constructed as a simple mobility model by including the job change variable. As argued, job change has a positive effect on salary growth. That is, if employees changed jobs, then their salary growth rates increased. The effect is statistically significant. Women had lower salary growth than men, considering job change, tenure,  $Salary_{t-1}$ , mobility characteristics in jobs, variance in tenure, and job size. When these conditions are identical, and the value of the job change variable is the same, women's salary growth was \$1,077 lower than men's growth. This result is consistent with literature from sociologists rather than labor economists.

Model 2 replaces the job-change variable with the gender category variable of jobs, which is supported by a group of sociologists. Like the previous model, women earned lower salary growth than men. However, the size became smaller and the reduced part was reflected via the gender category of jobs. That is, female jobs compensated less in terms of the growth than male jobs or balanced jobs.

Model 3 uses a group of mobility variables specified by the 10 patterns to consider job mobility and the gender composition of jobs together. As mentioned in the variables section, the focus is given to the following 6 patterns: stay in female jobs, and stay in male jobs, move between female jobs, move between male jobs, move toward female jobs, and move toward male jobs.

The differential salary growth by gendered job structure is explained by testing *Hypothesis 1, Hypothesis 2, and Hypothesis 3a and 3b*. First, *Hypothesis 1* is that *Stayers in male jobs are likely to gain steeper wage growth than stayers in female jobs*. In Table 5, the salary growth is significantly higher for continuity of male jobs than the reference group whereas the growth is significantly lower for continuity of female jobs than the reference group. Therefore, this shows evidence for *Hypothesis 1*. Similarly, *Hypothesis 2*—which is that *Mobility between male jobs is likely to pay higher wage growth rate than mobility between female jobs*—also finds a clue when comparing coefficients in mobility between male jobs to mobility between female jobs. Furthermore, when comparing the coefficients for continuity of male jobs to mobility between female jobs, this shows that the former rewarded higher salary growth than the latter. Therefore, these 4 mobility patterns are classified in the following order: mobility between male jobs, stay in male jobs, mobility between female jobs, and stay in female jobs. This summary



reveals that a clear hierarchy between male jobs and female jobs in terms of salary growth was constructed beyond the context of mobility.

The results regarding *Hypothesis 3a (Mobility toward male jobs will be likely to provide lower wage growth than mobility between male jobs)* and *3b (Mobility between female jobs will be likely to provide lower wage growth than mobility toward female jobs)* show how connections between male jobs and female jobs were stratified when compared to connections within each boundary. Through additional tests using different reference groups, the higher salary growth of mobility between male jobs than mobility toward male jobs was found. In fact, mobility toward male jobs even compensated lower salary growth than continuity of male jobs. This implies that male jobs, which were connected to female jobs, occupied the lowest rank among male jobs. This structure appears in the opposite way among female jobs. That is, female jobs, which were connected to male jobs, held the highest rank among female jobs. It means that *Hypothesis 3b* is also supported. The specific evidence comes from the negative coefficient of mobility between female jobs, comparing to mobility toward female jobs. In other words, under an assumption of similar salaries in prior male jobs and female jobs, current female jobs from prior male jobs paid higher salary growth than current female jobs from prior female jobs. Based on the positive outcomes from *Hypothesis 1* to *Hypothesis 3b*, the various job mobility patterns indicated a hierarchical structure as follows: mobility between male jobs, stay in male jobs, mobility toward male jobs, mobility toward female jobs, mobility between female jobs, and stay in female jobs.

Model 4 was applied to see the interaction effect between the individual gender and the job mobility variables on salary growth. The outcome presents whether female

employees in various job mobility patterns experienced additional positive or negative salary growth comparing to their male counterparts. First, the coefficient of being female became smaller. In addition, its significance became weaker compared to the previous models. Interestingly, the hierarchy structure in Model 3 indicated changes in this model. In short, there were no significant differences among mobility toward female jobs, mobility between female jobs, and stay in female jobs (the last two groups were tested using one of them as a reference group). On the contrary, mobility patterns related to male jobs (as a destination) were still meaningful for wage growth. The results from the interaction terms indicate that women in the job mobility patterns did not have additive salary growth rates except a case of continuity of male jobs among the 6 mobility patterns. The exception explains *Hypothesis 4a: Women are likely to gain additionally lower wage growth than men when both stay in male jobs*. If women and men worked in male jobs and stayed there, women's salary growth was not as steep as men's salary growth. There are two possibilities. One is that they might work in the same job but had different salary growth rates. However, a fact that the salary variation within jobs was small needs to be reminded. On the other hand, women and men were likely to work in male jobs but in different male jobs. This kind of gender differentiation regarding the job mobility patterns was not indicated in other routes. Thus, *Hypothesis 4b, which is that Women are likely to gain additionally lower wage growth than men when both move between male jobs* does not find evidence. This potentially implies that gender differentiation on working in male jobs: higher male jobs for men and lower male jobs for women, does not end up with gender differentiation on salary growth by mobility within the boundary of male jobs.

Table 5 Maximum likelihood estimates for the two-level models of changes in salary

| VARIABLES                              | Model 1                 | Model 2               | Model 3               | Model 4               |
|--|-------------------------|-----------------------|-----------------------|-----------------------|
| Job change                             | 262.09***<br>(21.56)    |                       |                       |                       |
| (Ref. Female job)                      |                         |                       |                       |                       |
| Male job                               |                         | 994.97***<br>(64.58)  |                       |                       |
| Balanced job                           |                         | 365.22***<br>(60.57)  |                       |                       |
| (Ref. Mobility toward female jobs)     |                         |                       |                       |                       |
| Mobility toward male jobs              |                         |                       | 319.07***<br>(105.18) | 269.28*<br>(141.35)   |
| Mobility between male jobs             |                         |                       | 735.55***<br>(85.10)  | 779.58***<br>(108.87) |
| Mobility between female jobs           |                         |                       | -172.95*<br>(101.62)  | 9.93<br>(480.56)      |
| Mobility between balanced jobs         |                         |                       | -110.62<br>(137.38)   | -501.72**<br>(197.18) |
| Continuity of male jobs                |                         |                       | 461.72***<br>(84.48)  | 512.03***<br>(108.49) |
| Continuity of female jobs              |                         |                       | -456.33***<br>(90.92) | -291.87<br>(223.07)   |
| Continuity of balanced jobs            |                         |                       | -48.35<br>(102.10)    | -56.85<br>(142.75)    |
| Transition toward male jobs            |                         |                       | -41.86<br>(119.36)    | -65.70<br>(173.16)    |
| Transition toward female jobs          |                         |                       | -156.32<br>(127.94)   | 36.55<br>(183.24)     |
| Female x Mobility toward male jobs     |                         |                       |                       | 113.83<br>(211.71)    |
| Female x Mobility within male jobs     |                         |                       |                       | -58.23<br>(244.38)    |
| Female x Mobility within female jobs   |                         |                       |                       | -230.65<br>(497.11)   |
| Female x Mobility within balanced jobs |                         |                       |                       | 726.95***<br>(275.05) |
| Female x Continuity of male jobs       |                         |                       |                       | -442.40**<br>(196.05) |
| Female x Continuity of female jobs     |                         |                       |                       | -214.79<br>(252.72)   |
| Female x Continuity of balanced jobs   |                         |                       |                       | 11.53<br>(204.25)     |
| Female x Transition toward male jobs   |                         |                       |                       | 28.96<br>(239.52)     |
| Female x Transition toward female jobs |                         |                       |                       | -369.49<br>(256.09)   |
| (Ref. male) Female                     | -1,076.96***<br>(36.08) | -303.24***<br>(61.34) | -362.83***<br>(61.53) | -274.02*<br>(156.72)  |
| Salary <sub>t-1</sub>                  | -0.18***                | -0.19***              | -0.19***              | -0.19***              |

|  |             |             |             |             |
|--|-------------|-------------|-------------|-------------|
|  | (0.00)      | (0.00)      | (0.00)      | (0.00)      |
| Tenure                                 | -33.83***   | -35.95***   | -32.64***   | -32.60***   |
|  | (2.49)      | (2.45)      | (2.47)      | (2.47)      |
| N of entries to a job                  | 14.96***    | 11.75**     | 15.62***    | 15.36***    |
|  | (5.09)      | (5.06)      | (5.06)      | (5.06)      |
| N of exits from a job                  | -8.95       | -6.61       | -10.41      | -10.33      |
|  | (6.54)      | (6.53)      | (6.52)      | (6.52)      |
| N of move-ins to a job                 | -0.24       | -0.71       | -2.24       | -2.12       |
|  | (3.54)      | (3.53)      | (3.53)      | (3.53)      |
| N of move-outs from a job              | -5.90**     | -5.56**     | -6.24***    | -6.12***    |
|  | (2.38)      | (2.38)      | (2.37)      | (2.37)      |
| N of unique working years within a job | 14.23***    | 11.50***    | 13.58***    | 14.17***    |
|  | (3.95)      | (3.91)      | (3.91)      | (3.92)      |
| Job size                               | 0.45        | 0.20        | 0.46        | 0.38        |
|  | (0.55)      | (0.54)      | (0.54)      | (0.54)      |
| Constant                               | 4,861.97*** | 4,138.75*** | 4,535.94*** | 4,500.10*** |
|  | (61.63)     | (81.84)     | (97.70)     | (118.60)    |
| Observations                           | 21,784      | 21,784      | 21,784      | 21,784      |
| Number of groups                       | 6,318       | 6,318       | 6,318       | 6,318       |

Standard errors in parentheses

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

## **CHAPTER V**

### **DISCUSSION**

What was the reason for the gender salary growth gap in this firm? With a limitation of only using its personnel data, the answer was a differentiated compensation system by the gender category of jobs. The effect of mobility worked under the mechanism and could not go beyond it. That is, movers' salary growth between female jobs was not higher than stayers' salary growth in male jobs. Furthermore, mobility between male jobs and female jobs implied sub-ranks within the gendered job boundary. (While salaries in prior jobs were controlled) Mobility from male jobs to female jobs paid higher salary growth than mobility between female jobs, which indicates that female jobs in the former mobility rank female jobs in the latter mobility. On the other hand, mobility from female jobs to male jobs paid lower salary growth than mobility between male jobs, which explains that male jobs in the latter mobility rank male jobs in the former mobility. In view of gender regarding the job mobility patterns, women and men typically did not experience differentiated salary growth except one case: staying in male jobs. In conclusion, not only female jobs but also connections by female jobs were undervalued and this finding is not different from prior studies. Petersen and Morgan (1995) explained that the mechanism of earnings inequality consists of job assignments and differentiated valuation of jobs by groups (representatively, gender). The job sorting is also specified through Cohen and Huffman's (2003) phrase such as devaluation of female jobs. DiPrete and Soule's (1988) "job ladder grouping" corresponds to a division between male job ties and female job ties. Although women and men in this study typically did not see differentiated salary growth in the same job mobility patterns, most women belong to female jobs and most men belong to male jobs. Under this context, women's mobility is

different from men's mobility in terms of salary growth.

Meanwhile, the results do not answer whether the job mobility structure is discriminative or not. Instead, they merely reveal the structure in itself. Therefore, the question needs an examination for employment and promotion processes considering employee job preference and employer bias. Thus, specific processes of how women and men moved to their jobs need to be investigated. There are likely to be procedures to move to some jobs such as filling the positions via social ties or requiring experiences in specific jobs, where are male-dominated. If this examination is not given, some may argue that the salary growth gap stems from different job tasks. However, such evaluation by tasks tends to depend on the level of claims, which is subjective and relative rather than objective and absolute, especially in the internal labor market. In this sense, future research should ask how salary is negotiated. This paper assumed equal pay for equal work since there was no wide salary variation within the same jobs. However, the negotiation process in other firms would be inevitable to understand the mechanism of salary growth.

This paper has limitations in the data set. One is that this is a case study of a particular firm: a case of an internal labor market, with promotions from low-skilled positions, with extreme male domination and gender segregation; therefore, the findings cannot be generalized to explain all gender wage gaps. Another limitation is that the dataset was documented in the 1990s when the internal labor market was available. However, a recent trend for low-paying jobs has been to outsource them. Those workers in the jobs are likely to change jobs externally to raise their wages because outsourcing firms tend to be specialized in an area and to pay wages in a narrower range. Hence, in

order to trace employees' careers and wages, both internal and external mobility should be examined together rather than focusing only on internal mobility. Recent employer-employee linked data with representative samples would be a solution for the limitations.

The methodological approaches also need further consideration. First, the category of jobs by the percentage of female workers requires more consistent sorting. The jobs consisted of 4-5 employees on average, thus the gender category of jobs had a possibility of fluctuation even by the small number of workers' job movement. Instead of depending on the percentage by a year, Budig (2002) decided the category if jobs indicated the same gender category three times in a row. If 4-5 employees are still too small, its upper organizations such as sub-department or department may be regarded as an alternative to define the gender category. In the meantime, the alternative approach needs a careful consideration, which is related to the second suggestion. That is, which level of segregation does impact more significantly on wage growth? In other words, segregation at job, workplace, occupation, or industry may be associated with differential wage growth. Tomaskovic-Devey and his colleagues (2006) also considered this notion and detected the difference. Last, this study used a set of composite variables to examine job mobility and the gender composition of jobs together. One drawback is the creation of too many categories, which can cause complicatedness in interpretation and lower statistical robustness. To be sure, there are many other ways to study the gender composition of jobs before and after mobility. One example would be to construct percent female at both  $t$  and  $t-1$ , and job mobility, respectively. In the separate setting, the gender category of jobs may be used at  $t$  and  $t-1$ . For combined effects, interaction terms would be adopted. In the end, these approaches will produce a fewer categories. A method paper

comparing each approach will shed light on strength and weakness of them.



## APPENDIX A

### MEN' AND WOMEN'S ANNUAL QUITTING RATES BY THEIR TENURES

| Tenure | 1992–1993 |       | 1993–1994 |       | 1994–1995 |       | 1995–1996 |       | 1996–1997 |       | Total |
|--------|-----------|-------|-----------|-------|-----------|-------|-----------|-------|-----------|-------|-------|
|        | Men       | Women | Men       | Women | Men       | Women | Men       | Women | Men       | Women |       |
| 0      | 23%       | 11%   | 29%       | 26%   | 28%       | 23%   | 29%       | 16%   | 27%       | 21%   | 27%   |
| 1      | 15%       | 13%   | 22%       | 16%   | 16%       | 16%   | 17%       | 11%   | 14%       | 19%   | 16%   |
| 2      | 8%        | 7%    | 17%       | 13%   | 15%       | 5%    | 11%       | 5%    | 12%       | 13%   | 11%   |
| 3      | 9%        | 12%   | 10%       | 16%   | 9%        | 5%    | 13%       | 15%   | 13%       | 12%   | 11%   |
| 4      | 6%        | 14%   | 14%       | 14%   | 16%       | 12%   | 7%        | 3%    | 9%        | 17%   | 11%   |
| 5      | 11%       | 11%   | 12%       | 16%   | 13%       | 12%   | 11%       | 8%    | 9%        | 11%   | 12%   |
| 6      | 5%        | 4%    | 11%       | 10%   | 12%       | 4%    | 9%        | 2%    | 13%       | 10%   | 9%    |
| 7      | 6%        | 11%   | 11%       | 11%   | 7%        | 11%   | 5%        | 11%   | 8%        | 15%   | 8%    |
| 8      | 6%        | 12%   | 6%        | 21%   | 10%       | 8%    | 5%        | 2%    | 8%        | 6%    | 7%    |
| 9      | 6%        | 15%   | 12%       | 21%   | 6%        | 3%    | 3%        | 4%    | 5%        | 14%   | 7%    |
| 10     | 8%        | 6%    | 9%        | 22%   | 7%        | 16%   | 2%        | 12%   | 8%        | 4%    | 8%    |
| Total  | 10%       | 11%   | 16%       | 18%   | 15%       | 12%   | 13%       | 9%    | 12%       | 14%   |       |

**APPENDIX B**

**MALE AND FEMALE MOVERS' AND STAYERS' FREQUENCIES AND PERCENTAGES BY THE TYPE OF CHANGE IN THE GENDER CATEGORY OF JOBS**

|              |              | Male movers |         | Female movers |         | Male stayers |         | Female stayers |         |
|--------------|--------------|-------------|---------|---------------|---------|--------------|---------|----------------|---------|
| Former job   | Current job  | Freq.       | Percent | Freq.         | Percent | Freq.        | Percent | Freq.          | Percent |
| Male job     | Male job     | 6,202       | 92.3%   | 64            | 5.6%    | 11,383       | 95.6%   | 210            | 7.7%    |
| Male job     | Balanced job | 146         | 2.2%    | 21            | 1.8%    | 72           | 0.6%    | 19             | 0.7%    |
| Male job     | Female job   | 31          | 0.5%    | 30            | 2.6%    | 0            | 0.0%    | 2              | 0.1%    |
| Balanced job | Female job   | 16          | 0.2%    | 122           | 10.7%   | 27           | 0.2%    | 90             | 3.3%    |
| Balanced job | Balanced job | 79          | 1.2%    | 88            | 7.7%    | 241          | 2.0%    | 253            | 9.3%    |
| Balanced job | Male job     | 171         | 2.5%    | 25            | 2.2%    | 84           | 0.7%    | 24             | 0.9%    |
| Female job   | Male job     | 52          | 0.8%    | 44            | 3.8%    | 0            | 0.0%    | 1              | 0.0%    |
| Female job   | Balanced job | 10          | 0.1%    | 98            | 8.6%    | 34           | 0.3%    | 113            | 4.1%    |
| Female job   | Female job   | 10          | 0.1%    | 653           | 57.0%   | 63           | 0.5%    | 2,015          | 73.9%   |
| Total        |              | 6,717       | 100.0%  | 1,145         | 100.0%  | 11,904       | 100.0%  | 2,727          | 100.0%  |

**APPENDIX C**

**MAXIMUM LIKELIHOOD ESTIMATES FOR THE TWO-LEVEL MODELS OF CHANGES IN SALARY**

| VARIABLES   | Male jobs: 0%-20% of pct. female<br>Balanced jobs: 21%-80% of pct. female<br>Female jobs: 81%-100% of pct. female |                        |                          | 0%-40% of pct. female<br>41%-60% of pct. female<br>61%-100% of pct. female |                       |                         |
|---|---|------------------------|--------------------------|--|-----------------------|-------------------------|
|   | Model 2   | Model 3                | Model 4                  | Model 2  | Model 3               | Model 4                 |
| (Ref. Female job)<br>Male job                                   | 1,024.76***<br>(65.78)  |                        |                          | 975.49***<br>(61.07)   |                       |                         |
| Balanced job  | 396.95***<br>(56.38)  |                        |                          | 341.19***<br>(81.96)   |                       |                         |
| (Ref. Mobility toward female jobs)<br>Mobility toward male jobs |   | -21.02<br>(95.69)      | -210.32<br>(127.98)      |  | 464.29***<br>(124.69) | 643.62***<br>(172.11)   |
| Mobility between male jobs                                      |   | 520.51***<br>(79.23)   | 410.43***<br>(97.62)     |  | 955.80***<br>(101.75) | 1,209.68***<br>(133.52) |
| Mobility between female jobs                                    |   | -350.93***<br>(102.68) | -485.83<br>(1,121.86)    |  | 1.61<br>(113.97)      | 402.37<br>(347.54)      |
| Mobility between balanced jobs                                  |   | -280.07**<br>(109.15)  | -641.38***<br>(151.04)   |  | 61.81<br>(228.91)     | -265.36<br>(336.71)     |
| Continuity of male jobs   |   | 246.81***<br>(78.53)   | 141.67<br>(97.14)        |  | 682.47***<br>(101.20) | 946.23***<br>(133.22)   |
| Continuity of female jobs                                       |   | -657.18***<br>(87.69)  | -1,148.14***<br>(289.90) |  | -255.53**<br>(105.50) | 161.10<br>(184.08)      |
| Continuity of balanced jobs                                     |   | -237.81***<br>(87.37)  | -376.87***<br>(116.90)   |  | 221.33<br>(155.93)    | 484.31**<br>(220.01)    |
| Transition toward male jobs                                     |   | -272.67**<br>(108.09)  | -295.93**<br>(144.42)    |  | 72.10<br>(161.37)     | 281.97<br>(235.98)      |
| Transition toward female jobs                                   |   | -378.36***<br>(127.47) | -342.69*<br>(179.47)     |  | 35.53<br>(153.86)     | 344.90<br>(214.77)      |
| Female x Mobility toward male jobs                              |   |                        | 427.58**<br>(192.83)     |  |                       | -393.16<br>(249.71)     |
| Female x Mobility within male jobs                              |   |                        | 473.19*                  |  |                       | -278.65                 |

|  |             |             |             |             |             |             |
|--|-------------|-------------|-------------|-------------|-------------|-------------|
|  |             |             | (279.61)    |             |             | (246.18)    |
| Female x Mobility within female jobs   |             |             | 289.16      |             |             | -694.70*    |
|  |             |             | (1,129.26)  |             |             | (378.25)    |
| Female x Mobility within balanced jobs |             |             | 750.48***   |             |             | 528.55      |
|  |             |             | (219.13)    |             |             | (459.15)    |
| Female x Continuity of male jobs       |             |             | -57.48      |             |             | -787.66***  |
|  |             |             | (207.39)    |             |             | (215.16)    |
| Female x Continuity of female jobs     |             |             | 652.11**    |             |             | -717.52***  |
|  |             |             | (312.58)    |             |             | (233.21)    |
| Female x Continuity of balanced jobs   |             |             | 322.42*     |             |             | -555.28*    |
|  |             |             | (176.02)    |             |             | (311.75)    |
| Female x Transition toward male jobs   |             |             | 60.00       |             |             | -453.04     |
|  |             |             | (217.52)    |             |             | (324.00)    |
| Female x Transition toward female jobs |             |             | -17.26      |             |             | -653.26**   |
|  |             |             | (255.78)    |             |             | (307.77)    |
| (Ref. Male) Female                     | -301.91***  | -407.27***  | -674.46***  | -315.85***  | -320.36***  | 226.40      |
|  | (60.57)     | (58.83)     | (147.65)    | (59.99)     | (62.84)     | (192.10)    |
| Tenure                                 | -35.19***   | -31.76***   | -31.73***   | -35.84***   | -32.55***   | -32.47***   |
|  | (2.46)      | (2.47)      | (2.47)      | (2.46)      | (2.47)      | (2.47)      |
| Salary <sub>t-1</sub>                  | -0.19***    | -0.19***    | -0.19***    | -0.19***    | -0.19***    | -0.19***    |
|  | (0.00)      | (0.00)      | (0.00)      | (0.00)      | (0.00)      | (0.00)      |
| N of entries to a job                  | 10.81**     | 14.42***    | 14.33***    | 11.74**     | 15.67***    | 15.53***    |
|  | (5.06)      | (5.07)      | (5.07)      | (5.06)      | (5.06)      | (5.06)      |
| N of exits from a job                  | -6.93       | -10.54      | -10.52      | -6.48       | -10.08      | -9.90       |
|  | (6.53)      | (6.52)      | (6.52)      | (6.53)      | (6.52)      | (6.51)      |
| N of move-ins to a job                 | 0.33        | -1.43       | -1.64       | -0.77       | -2.52       | -2.31       |
|  | (3.53)      | (3.53)      | (3.53)      | (3.53)      | (3.53)      | (3.53)      |
| N of move-outs from a job              | -5.08**     | -5.93**     | -5.93**     | -5.35**     | -6.18***    | -6.04**     |
|  | (2.38)      | (2.37)      | (2.37)      | (2.38)      | (2.37)      | (2.37)      |
| N of unique working years within a job | 13.93***    | 15.35***    | 15.71***    | 12.31***    | 14.22***    | 14.43***    |
|  | (3.91)      | (3.92)      | (3.92)      | (3.92)      | (3.92)      | (3.93)      |
| Job size                               | -0.13       | 0.23        | 0.19        | 0.21        | 0.49        | 0.45        |
|  | (0.54)      | (0.55)      | (0.55)      | (0.54)      | (0.54)      | (0.54)      |
| Constant                               | 4,144.31*** | 4,786.59*** | 4,906.09*** | 4,161.22*** | 4,334.20*** | 4,080.18*** |
|  | (82.73)     | (92.35)     | (108.30)    | (79.24)     | (111.76)    | (140.36)    |

|                  |        |        |        |        |        |        |
|------------------|--------|--------|--------|--------|--------|--------|
| Observations     | 21,784 | 21,784 | 21,784 | 21,784 | 21,784 | 21,784 |
| Number of groups | 6,318  | 6,318  | 6,318  | 6,318  | 6,318  | 6,318  |

Standard errors in parentheses

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

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