WOMEN'S WORK-LIFE CONFLICT

A Dissertation

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Abstract

The labor force participation rate of married Japanese women aged 25 to 34 in 2016 was about 59.2%. On the other hand, the participation rate of single Japanese women aged 25–29 who continuing to work after graduation was 91.1% in 2016 (Cabinet Office 2015). The Cabinet Office reports that in 2016, the most common reason for quitting was pregnancy; the rates were 29.0% for full-time workers and 41.2% for part-time workers. This suggests that Japanese women are somewhat conflicted between work and home life. This conflict is said to mainly come from Japanese-style employment practices such as long working hours, and the fact that much time is spent on household management, especially childcare.

Under these conditions, the aim of this dissertation was to explore the work–life conflict by empirically examining the following three points. First, regarding the intergenerational linkage between women and their mother's employment, the mother's employment has a negative impact on the daughter's perception of the gender division of household labor, and has a positive impact on employment. Second, as for the Japanese phenomenon called "first grade shock," that is, when the mothers' time constraints become tighter because of the sudden reduction of childcare support from the government and because of the increased demands on parenting when their children

enter the first grade, the share of mothers' employment as part-time workers increases and shows consistent evidence of women's perceptions of work–life conflicts, equal share of housework, emotional distress, and their concerns about their children's lives—all of which support the existence of "first grade shock." Finally, regarding the prevalence of long working hours and women's occupational choices, the prevalence of long working hours and overwork negatively affects women's occupational choices, regardless of their marital status, level of education, and existence of child. Furthermore, the adoption of 40-hour workweek system in Korea is positively associated with the share of married women in that industry-occupation.

Policy implications from these findings are the need to give proper guidance to women before pregnancy or childbirth, or to hold a workshop for them with other women of relatively close age who have already experienced childbirth and childcare; the need for longer operating hours for after-school childcare programs, and proper mentoring or guidance regarding their children's first year in school; and the need to ease poor working conditions such as the long working hours, promote flexibility, and adopt a 40-hour workweek system in Korea—all of which would be attractive for Japanese women.

Dedication

To my family, Yuki, Honoka and Hideaki

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The findings and conclusions of this dissertation are all mine, and I am responsible for all the mistakes in this dissertation.

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Chapter 1: Introduction

1.1 Introduction to the Dissertation

The labor force participation rate of married Japanese women of age 25–34 in 2016 was about 59.2%; the participation rate for single Japanese women was 91.9% for women 25–29, and 90.1% for single women 30–34. The rate of single Japanese women aged 25–29 who continued to work after graduation was 91.6% in 2006, and 91.1% in 2016 (Cabinet Office 2015). This proportion is as high as the rate for both single and married women in Germany (about 80%), France (about 85%) and Sweden (about 90%). Even though the government is working to provide child-rearing support systems, 39.0% of Japanese women working full-time and 42.5% of women working part-time quit their jobs because of childcare issues (Ministry of Health, Labor, and Welfare 2015). Moreover, 26.1% of women working full-time and 16.4% of women working part-time quit their jobs because of work–life conflicts (Ministry of Health, Labor, and Welfare 2015).

Japanese women have long struggled to balance work and home life. This can be seen in the gap of the labor participation rates between single and married women and the fact that women actually report the reason for quitting their job as being because

of childcare and their work-life conflict. This also suggests that woman's quitting work around the time of childbirth is still a critical problem for Japanese labor policy (Cabinet Office 2015).

The struggle of work-life conflict comes from both aspects of work and life. Regarding work, long working hours have been common in Japanese-style employment practice, while in the rest of life, much time is spent on household management, especially childcare.

Japanese-style employment practice is one of the most significant features of working practice (Yashiro 1997). In Japan, long-term employment has been maintained to emphasize the accumulation of workers' skills through in-house training. This long-term employment security is desirable for workers in terms of bringing stability to their lives; on the other hand, employers tend to hire a minimum number of workers so that during recessions, they can adjust employment figures by reducing the working hours of individual workers rather than reducing the number of employees. As a result, workers are likely to work long hours on a permanent basis (Yashiro 1997). Also, to make effective use of the limited number of workers, in addition to the long working hours, employers require workers to work in a way that suits employers' convenience, such as sudden or constant overwork, working on holidays, and being transferred at will

(Kawaguchi 2008). However, this kind of working pattern can be maintained only if workers, mainly men, work outside the home.

On the other hand, in a life that focuses mainly on household management such as childcare and housework (Kawaguchi [2017], Oishi [2019]), housework, like cleaning and washing, can be simplified or done on weekends, while childcare, such as bathing children or putting them to bed, overseeing their homework, and helping them prepare for school once they enter elementary school, cannot be done only on weekends (Ōishi 2019). Furthermore, it is often the case that household management, especially childcare, directly connects to women's life satisfaction or burden. As Holloway et al. (2006) point out, Japanese women show a higher level of life satisfaction when they self-assess as an effective parent who can support, teach, and understand their own children. Dudley-Marling (2001) mentions that mothers with poorly performing children often feel a great economic burden. When providing such careful childcare, no matter how much time is spent, it never seems to be enough. As a result, Japanese women specialize in household management, especially childcare, until they feel it a burden.

In this way, the division of labor between work and life has existed stably for a long time in Japanese households. However, if women work outside the home while

balancing work and life, this stable situation may become one of the major obstacles for work‐life balance.

In light of situations that lead to work–life conflicts, this dissertation focuses on the following three points to explore the work‐life conflict: intergenerational linkage between women and their mothers' employment to see if modern women still follow the direction of their mothers from a generation earlier when they decided to work; women's work–life conflict when a child enters the first grade, to examine how women behave when the government's support for childrearing shrinks and the childcare burden required from schools increases ("first grade shock"); and the prevalence of long working hours and the occupational choices of women, to examine how the working environment affects women's occupational choice. All of them are empirically examined in an attempt to clarify the background of work‐life conflicts. Finally, based on this study's analysis, some policy implications are made to ease the work–life conflict.

This introductory chapter is organized as follows: Section 1.2 presents the overview of main three chapters of the dissertation: "Mothers and Daughters: Intergenerational Linkage between Women and Their Mothers' Employment in Japan" (1.2.1), "First Grade Shock: Women's Work‐Life Conflict in Japan" (1.2.2), and

"Prevalence of Long Working Hours and the Occupational Choices of Women: Evidence from Japan and Korea" (1.2.3). Finally, Section 1.3 presents the organization of the dissertation.

1.2 Overview of the Dissertation

1.2.1 Overview of Chapter 2: Mothers and Daughters: Intergenerational Linkage between Women and Their Mothers' Employment in Japan

In this section, the intergenerational linkage regarding working attitude and working style between women and their mothers in Japan is presented.

Despite the Japanese government's efforts to provide child-rearing support systems, around 40% of Japanese women quit their jobs for reasons related to pregnancy and childcare, especially when their children are young. Within that scenario, this study examines the impact of the mother's working condition when her daughter is three, six, and twelve years old; the impact on the daughter's perception of gender division of household labor; the daughter's working decisions one year and three years after her first childbirth; and the impact of working continuously, starting immediately after graduation from school until the present. Data from the National Survey of Households with Children 2012 and 2014 was used for analysis.

The results are as follows. Firstly, a woman having a working mother is less likely to be in favor of the gender division of household labor. This effect is stronger when her mother used to work full-time. Also, the effect is stronger for women who were younger when their mother was working.

Secondly, women whose mothers worked during the women's childhood are more likely to (re)join labor force market one or three years after first childbirth.

Finally, overall, the impact on a woman working continuously is not as strong as in the other two cases. Despite that, the impact of a mother working when her daughter is three years of age is still statistically significant and has a positive effect.

This empirical evidence suggests that an intergenerational linkage between mother and daughter exists with respect to working status.

Women need to be given proper guidance before pregnancy or childbirth, or be involved in a workshop with other women of relatively close age who have already experienced childbirth and childcare, so that they do not have to follow their mothers' employment choices made in a time when fewer childcare support systems were provided than they are today.

1.2.2 Overview of Chapter 3: First Grade Shock: Women's Work–Life Conflict in Japan

In this section, the Japanese phenomenon called "first grade shock," that is, the tighter time constraints on mothers because of the sudden reduction of child care supports from the government and the increased demands for parenting when their children enter elementary school is presented.

In Japan, where the responsibility for childrearing lies mostly with women, mothers experience tighter time constraints and increased demands for parenting when their children enter elementary school. This phenomenon is called "first grade shock," and has been recognized by the media and government, though very few scholars have quantitatively examined it. Our study therefore employs unique data from the national survey conducted by the Japan Institute for Labor Policy and Training in 2012 and 2014, which contains detailed information about mothers' employment and their level of emotional distress, to examine the existence of first grade shock. A difference-in-difference framework is used for analysis. Our empirical investigation shows that the percentage of mothers employed as part-time workers tends to increase when their children are in the first grade but returns to the previous level the following year. We also present consistent evidence of women's perceptions on work–life

conflicts, on the question of both parents sharing housework equally, and on their level of emotional distress, as well as evidence regarding their concerns about their children's lives—evidence that supports the existence of first grade shock.

Immediate policies to attenuate first grade shock, such as after-school childcare programs that are open for as many hours as the nursery is open, proper mentoring or guidance regarding their children's first year is necessary. Lastly, childrearing and housework burdens should be equally distributed within the family.

1.2.3 Overview of Chapter 4: Prevalence of Long Working Hours and the Occupational Choices of Women: Evidence from Japan and Korea

In this section, an international comparison of prevalence of long working hours and women's occupational choice in Korea and Japan is presented.

Japan and Korea are notorious for prevalence of long working hours. Women who are faced with tighter time constraints usually choose an occupation with shorter working hours. In this paper, we aim to show, how long working hour affects women's occupational choices in two countries. Data from labor force surveys in Korea and Japan from 2002 to 2016 were used for analysis. The key dependent variable in this analysis was the distribution of women in each

industry-occupation cell. We used the mean working hours of male workers and the share of men working more than 50 hours a week as proxies for long working hours and workplace inflexibility.

Our empirical evidence suggests that, in general, the prevalence of long working hours and overwork affects women's occupation choices regardless of their marital status, level of education, and existence of child. Furthermore, we provide evidence that the adoption of 40-hour workweek system in Korea is positively associated with the share of married women in that industry-occupation. Our results imply that long-working hour is a key source driving out women workers and thereby calls policy makers' attention to workplace flexibility.

1.3 Organization of the Dissertation

The structure of this dissertation is as follows: Chapter 2 examines intergenerational linkage between women and their mothers' employment in Japan to examine whether women today follow their mothers' working style of a generation ago when they decide to work. Chapter 3 examines the work‑life conflict of women facing the Japanese phenomenon of "first grade shock," when mothers experience tighter time constraints because of the sudden reduction of child care supports from the government

and the increased parenting demands when their children enter elementary school. Chapter 4 examines an international comparison of the prevalence of long working hours and women's occupational choices between Korea and Japan. Finally, Chapter 5 summarizes the main findings, offers some policy implications based on each chapter, and indicates some possible extensions of the research.

Chapter 2 Mothers and Daughters: Intergenerational Linkage between Women and Their Mother's Employment in Japan

2.1 Introduction

Despite the Japanese government's efforts to provide childcare support systems, one of the most common reasons women leave employment during the period between the detection of pregnancy and childbirth is because of a wish to devote themselves to childcare. According to the Japan Institute of Labour Policy and Training, in 2015, 48.9% of women quit their jobs during the period between the detection of pregnancy and three years after the first delivery because of a wish to devote themselves to childcare. The Cabinet Office reported this in 2016 as the most common reason for leaving employment during the first pregnancy, 29.0% among the full-time workers and 41.2% among the part-time workers. This trend can be observed for various stages of life. For example, 18.6% of mothers left their most recent job to devote themselves to childcare, and 54.9% of unemployed married women report wanting to devote themselves to childcare. This trend can also be seen among those living below the relative poverty line (Zhou 2018). However, about 4.4% of women who left their jobs because of the latest childbirth reported that they cannot make use of the support

systems, such as maternity and childcare leave, because they are not easy to use (Cabinet Office 2016).

In general, even though over 90% of women in Japan participate in the labor force market after graduating from school, many still leave their jobs without using maternity and childcare leave. This means that, despite the availability of the government childcare support measures, some women do not take advantage of them and leave employment in order to care for their child. On the other hand, as shown above, fewer women quit their jobs because of a work-life conflict than expected. So, it can be said that the women's norm that they can take advantage of childcare support measures and sontinue to workis potentially important to raise Japanese women's labor market participation. According to Fukuda and Kashiwagi (1980), Iwanaga (1990), Tazawa (2010), Mizutani (2015), working mothers positively affect their daughter's view of professions. This means that women's labor participation might be influenced by some of their mother's norms.

This study examines whether women's labor force participation is affected by having a working mother during childhood. This is an extension of previous studies mentioned in the previous paragraph. These studies show a positive correlation between a daughter's perception of work and her mother's employment; however, they do not

examine whether the mother's employment during the daughter's childhood affects the daughter's actual participation in the force, especially before and after childbirth. Furthermore, the data used for many of the previous studies are obtained from particular high schools or colleges in specific locations. A Japanese study that used the national data such as Tanaka (2008) mainly examines the impact of the employment status on the child at the age fifteen, which is considerably older than the interest of this study. The purpose of this study is to examine the impact that working mothers caring for their daughters had on the daughter's working decisions in adulthood, when they are mothers themselves and need to work especially before or after childbirth. The daughter's age when the mother decided to work is important for this analysis.

Therefore, this study examines the effect of the mother's employment on her daughter' perception of the gender division of household labor, at ages three, six, and twelve years old, in order to compare consistency with previous studies. It further examines how the mothers' work status during the daughter's childhood affects the daughter's working decisions after the first childbirth. It further examines the effect of the mother's employment during the daughter's childhood on the daughter's decision to continue working from graduation to the year of the survey.

This study is also in line with the previous studies showing various kinds of intergenerational linkage between mother and daughter, such as the one by Antel (1992), which examined the intergenerational linkage in the use of social welfare systems, and the study by Fernández, Fogli and Olivetti (2004), which analyzed the relationship between mothers-in-law and the wives of their sons. This present study contributes to the literature by examining the relationship between women and their mothers in terms of employment.

The analysis of the study is based on the data pooled from the National Survey of Households with Children (NSHC) conducted in November 2012 and 2014 by the Japan Institute for Labour Policy and Training (JILPT). The findings show that, first, a woman having a working mother is less likely to be in favor of the gender division of household labor. The effect is stronger when the woman's mother worked full-time. Additionally, the effect is the strongest when the woman had a working mother at the age of three. Results also show that the woman whose mother worked during the woman's childhood is more likely to (re)join the labor force market one or three years after the first childbirth. The impact was stronger when the mother worked full-time. Finally, the impact on the continuation of employment is not as strong as in the other two instances. Despite that, the impact of having an employed mother at the age of three is statistically significant and has a positive effect.

The empirical evidence proves the existence of the intergenerational linkage between mothers and daughters, with respect to employment in Japan, but the effect gradually diminishes.

This paper is organized as follows. In section 2, I review the relevant literature on the various types of intergenerational linkage, such as between the mother and the daughter and the mother in-law and the daughter-in-law, to see how the employment style or norm affects the daughter In section 3, I overview the surroundings of women from the data to demonstrate that women tend to leave their jobs without using childcare support to devote themselves to childcare and later return to work part-time earning lower wages. In section 4, I introduce our data and empirical strategy. In section 5, I present our empirical results and provide an interpretation. I conclude in section 6.

2.2 Literature review

Many studies have examined the effect of the parents' employment status on their children. These studies can be roughly classified into three categories: the relationship between the woman and her mother; that between the woman and her mother in-law; and that between the man and his father. Concerning the relationship between the woman and her mother, especially, the previous studies examined the

relationship between the mother's employment status and the daughter's perception toward employment or between the expectation of daughter's working style and her perception toward working.

Regarding the relationship between the woman and her mother, for example, Antel (1992) examined the probability of using social welfare systems if the woman's mother used them, at the ages fourteen to nineteen in 1979 in the US, and found that the probability of women using social welfare systems increased if the mother used social welfare systems. Morrill and Morrill (2013) also mentioned that the intergenerational linkage of labor participation rate and the employment type between daughters and their mothers existed in the US when the examined data included the General Social Survey from 1975 to 2008 and the Survey of Income and Program Participation from 1986 to 1998. It also indicates that, while the relationship between the mother and daughter does exist, the relationship between the mother in-law and daughter-in-law is stronger.

In Japan, some studies have examined both the daughters' views of profession and the actual employment. The studies explored how parents' employment type affects the daughter's view of the working style in adulthood. Many findings show that working mothers positively affect their daughters' view of professions and the gender division of household labor (Fukuda and Kashiwagi 1980, Iwanaga 1990 Muramatsu

1994 Tazawa 2010 Mizutani 2015). Nagao (2008) analyses the relationships between the mother's types of employment and women's view of careers. It found that, even though the women agreed on the perception of gender division of household labor when they were in high school, they changed their minds after graduation when they started working if their mother was working.

The woman's decision regarding employment is affected not only by her mothers' actual employment status, but also the mothers' expectations for the daughter's career. Muramatsu (1994) and Nakamura (2013a) concluded that the expectations for the college-age daughters' career are affected by both the mothers' actual type of employment and their expectations.

However, unlike the results in the US, when women choose their jobs, the effects of their mothers do have some variations in Japan. According to Munekura and Ichikawa (1991), although the mothers worked full-time, the decision regarding work had some variations and the types of employment they chose were not statistically significant. Nakamura (2013a) has analyzed the actual careers of women who have graduated from 4-year universities located in the capital area and their type of employment after marriage and childbirth. This study found some correlation between the life course of women and that of their mothers , but when conducting logistic

analysis, the effects were not statistically significant. Nakamura (2013a) also concluded that among women who belonged to the "intermediate level" women's collage which featured both business education and liberal arts, daughters often quit their jobs. According to Tanaka (2008), on the other hand, when mothers work full-time, daughters also work full-time.

In Japan, women's views of professional careers are affected by the work status of their mothers. However, when it comes to their actual work status, the results have some variations.

There are positive relationships between women and their mothers-in-law. Fernánde Fogli and Olivetti (2004) found that sons whose mothers worked married women who worked. Morrill and Morrill (2013) also found that the intergenerational linkage of employment type is stronger between women and their mothers-in-law than that of daughters and their mothers. Furthermore, Kawaguchi and Miyazaki (2007) showed that, when mothers-in-law work full-time, women also work full-time. This result is the same as Morril and Morril (2013).

When looking at the relationships between men and their fathers with respect to the working pattern, Dunn and Holtz-Eakin (1996) and Corak and Piraino (2011) conclude that fathers' jobs affect the men's jobs, but it is because men succeed fathers'

human capital. In Japan, the effect of the father toward the men's jobs also exist to the agriculture and self-employed because they inherit the capital and they usually have chance to transfer (Miwa 2010). This result is the same as Dunn and Holtz-Eakin（1996）and Corak and Piraino（2011).

The mother's effect on the working situation of men is different from that of women in Japan (Miwa 2010). Tanaka (2008) has also had similar results. When mothers work full-time, the educational attainment of men is lower (Tanaka 2008).

Other interesting surveys with respect to intergenerational linkage are presented below:

The intergenerational linkage with regard to the perception of gender division of household labor is weaker than that of religion. When the bond between parents and children is stronger, it takes some time for the effect to vanish (Min, Silverstein and Lendn 2012). In Japan, I could not find studies related to religion, but there is a Japanese study regarding the special effect. Among women who lived in the prefecture where women's labor force participation rate was higher during their childhood, the type of employment their mothers chose positively affected daughters' working hours (Mizutani 2015).

2.3 Background

2.3.1 Surroundings of the female worker：employment type and wage

In this subsection, I point out that, by looking at the difference in income between part-time and regular employees, if women decide to come back to work, it is more profitable for them to continue working full-time while utilizing the government's childcare support system than to switch to part-time employment.

In Japan today, many women regularly work full-time right after graduation from school, and even though they quit their jobs before or after childbirth, they return to the labor force as part-time workers. According to the Comprehensive Survey of Living Conditions, the female labor force participation rate by age group is that, at the age '15 to 19' to '35 to 39', they mainly work regularly, but from the age '35 to 39', many start working part-time (Ministry of Health, Labor and Welfare 2015). This suggests that, although women are employed as full-time workers from the start of their carriers, many quit their job and later work part-time. As a result, they face a wage difference compared to full-time workers.

<Figure 2.1 to be Inserted Here>

<Table 2.1 to be Inserted Here>

According to JILPT 2014, 69.4% women worked regularly right after graduation from school; however, as of 2014, only 36.0% worked full-time. Previous surveys showed almost the same results (78.4% full-time right after graduation but 36.1% in 2011, 75.0% full-time right after graduation but 35.5% in 2012). The wage difference between full-time workers and part-time workers for women only is shown in Figure 2.1 and Table 2.1. Figure 2.1 shows the distribution of wages between full-time workers and part-time workers by using Kernel density distribution. As shown in Figure 2.1, the wages of part-time workers are lower, regardless of their age, educational attainment etc., whereas those of full-time workers have some variation. Table 2.1 shows the average wage by employment type. This table shows that the average wage of women working regularly is about 1,554 yen per hour, whereas that of women working part-time it is only 853 yen per hour or 1.8 times lower. Furthermore, the average wage of female workers who continue to work right after graduation from school is 2,059 yen, or about 2.4 times as high as that of those working part-time.

These figure and table show the importance and profitability of continuing to work in regular employment, especially the first regular job, by using support provided by the private or public sector because it might affect the wage gap in the long run.

2.3.2 Surroundings of the female worker：Use of Maternity Leave and other Child Care Support Systems

In this subsection, I present that women are not effectively making use of maternity, childcare leave, and other childcare support systems. As it was shown in the previous subsection, despite there being wage differences between full-time and part-time employed women, many working women quit their jobs without using child care support systems.

According to the White Paper on the National Life Style 2006 (*2006 nen Kokuminn Seikatu Hakusyo*), as of 2006, 53.6% women quit their jobs because of childcare. The national survey of work-life balance of men and women with children conducted by the Ministry of Health, Labor and Welfare in 2009, shows that 39.2% of women working full-time and 42.5% of those working part-time quit their job because of childcare. In 2014, the situation is almost the same. 47.0% working women quit their jobs right after the pregnancy or before the first childbirth (JILPT 2015). Furthermore, the reason why married women are not working is because they have to take care of their children (54.9%), which ranks as the primary reason for not working (JILPT2015). Japanese women have long been devoted to taking care of their children and this trend still continues today.

<Table 2.2 to be Inserted Here>

Table 2.2 shows women who think that they have not used childcare support systems and do not intend to use them in the future. This survey poses several questions about childcare support systems. Each question has multiple choice of “Using now,” ”Used in the past,” ”No experience in using in the past and do not intend to use in the future,” and “Do not know the system.” Those who “Do not know the system” were removed from the sample and the ratio was calculated for “No experience in using in the past and do not intend to use in the future.” The results show that, regarding childcare leave, 66.5% women have “no experience in using in the past and do not intend to use in the future” and about 60% to 90% women “do not use other childcare support systems” (Table 2.2).

This implies that many working women are familiar with the childcare support systems and are eligible to use them, but they have not used them before or do not intend to use them in the future. These women might quit their jobs without using them. And then, as many government reports point out, women come back to work as part-time workers for lower wages regardless of their age or educational attainments.

The following is a summary of the above sections. Despite the fact that many women are regularly hired after graduation from college, they leave their jobs before and after childbirth and take care of children without using childcare support provided by the government, and they work part-time for low wages, even though it is not profitable for them.

From the next section, I quantitatively examine whether there is an intergenerational linkage between mothers and daughters in terms of employment. This is based on the previous studies showing that mothers' employment is related to their daughters' perception of their work.

2.4 Empirical Strategies

2.4.1 Data

This study presents an analysis of the data pooled from the National Survey of Households with Children (*Kosodate Setai Zenkoku Chōsa*). Conducted in November of 2012 and 2014 by the Japan Institute for Labour Policy and Training, the survey affected individual characteristics, household characteristics and employment-related data on mothers (or single fathers) of underaged children ages 0 to 18. For each year, two-stage stratified sampling from the Basic Resident Registry (*jūmin kihon daichō*)

produced a target sample of 4,000 households, both two-parent and single-parent. The interviewers delivered a self-administered questionnaire to the respondents' homes and returned to collect the completed questionnaires at a pre-specified date and time.

Respondents consisted of 2,201 women surveyed in 2012 and 2,197 women surveyed in 2014. The valid response rates were kept at a constant rate of around 55%. This main current analysis examines the effect of mother's type of employment when the respondent (daughter) was a child on the current working style of the daughter. Single-father households were excluded. Finally, because the response rate from single-parent households was lower than two-parents household, post-stratification weights provided by the JILPT were used to estimate (JILPT2015)[1].

The survey items include women's life events, such as childbirth, access to childcare, and employment status. The data also contained career choice and employment patterns from the time of graduation or school leaving, and the type of employment at one year and three years after birth of the first child. This survey data also includes employment type of the mother when the woman was three, six, and twelve years of age, so it is possible to examine the effect of mother's type of

[1] Please take a look at JILPT(2015) pp.6 for detail.

employment during the daughter's childhood and on the daughter's work-related decisions during relevant life events, such as pregnancy, childcare and continuing to work after graduation from school.

2.4.2 Empirical model

To empirically examine the effect of mother's employment on the daughter's perception of gender division of household labor and employment outcomes, I conducted the logistic regression analysis of these binary dependent variables with sampling weight[2].

$$Y_i \begin{cases} = 1 \ if \ Y_i^* > 0 \\ =0 \ else \end{cases}$$

$$P(Y_i = 1|X_i) = P(Y_i^* > 0|X_i)$$

The latent variable Y_i^* takes the form:

[2] For more information on sampling weight, see page 6 JILPT (2015).

$$Y_i^* = \beta_0 + \beta_1 Motheremp_i + Present_i{}'B_2 + Past_i'B_3 + Area_i + Year_i + \varepsilon_i$$

(1)

where Y_i^* indicates the outcome variable of daughter *i*. $Motheremp_i$ is a key variable for the mother's work status when daughter *i* was three, six, and twelve years old. $Present_i$ is a set of variables that includes characteristics of daughter *i*, her children, her husband, and present home background. $Past_i$ is a set of variables that indicates home background during daughter *i*'s childhood. $Year_i$ indicates the survey year of daughter *i* and $Area_i$ is the residential area of daughter *i*.

For further examination of the most effective age of daughter *i* regarding mother's working condition, we extend equation (1) to create the framework:

$$Y_i^* = \beta_0 + \beta_1 Motheremp_i^3 + \beta_2 Motheremp_i^6 + \beta_3 Motheremp_i^{12} + Present_i{}'\Gamma_1 +$$

$$Past_i{}'\Gamma_2 + + Area_i + \ Year_i \ + \varepsilon_i \qquad (2)$$

where $Motheremp_i^3$ to $Motheremp_i^{12}$ are indicators of the mother's employment status when daughter *i* was at ages of three, six, and twelve. β_1 to β_3 show how the work status of the mother when the daughter was three, six and twelve affected daughter *i*'s outcomes changed. This framework allows us to determine the age at which the

mother's employment status has the most significant effect on the daughter *i* that grows up to be a mother. Precise sets of variables are shown below.

2.4.3 Variables

The definitions of variables are shown below.

① Outcome variable of daughter *i* (y_i).

Perception of the gender division of household labor:

Responses "strongly agree" and "agree" to "Husbands should work and wives should stay at home" are designated as "agree" and "disagree," while "strongly disagree" is designated as "disagree."

Work-related decision one and three years after first childbirth:

The dummy variable for "working" includes "full-time, regular," "part-time," "short-contract, contract and dispatched," "self-employed," and "other" one year and three years after the first childbirth.

Continuing to work:

1. "continued to work at the same company from graduation to present" and 2. "have some experience of changing jobs but have continued working from graduation to present" are designated as "continued to work."

② Mother's type of employment when daughter i was a child（$Motheremp_i$）

"Mother's employment type" is "full-time," "part-time," or "not working" when the daughter was three, six and twelve years old, respectively.

"Mother's decision regarding work" is defined as a dummy variable whether working "full-time" or "part-time" or not working when the daughter was three, six and twelve respectively.

"Mother returning to work" is defined as follows: returning to work at the daughter's age of three is a dummy variable indicating that the mother was working "full-time" or "part-time" at the daughter's age of three. Returning to work at the daughter's age of six is a dummy variable indicating that the mother was working "full-time" or "part-time" at the daughter's age of six but not working at the daughter's age of three, and coming back to work at the daughter's age of twelve is a dummy variable indicating that the mother was working "full-time" or "part-time" at the daughter's age of twelve but not working at the daughter's age of three and six.

③ Present condition of daughter i ($Present_i$)

The control variables are age, educational attainment, regular employment right after graduating from school, employed by a large company immediately after graduation from school, employed as a public servant right after graduation, employed after Equal Employment Opportunity Law had been passed, and delivery of the first child after childcare leave was made compulsory. Marital status, number of children, age of the youngest child, co-residence with parents (or in-laws) or not, annual income, husband's annual income, husband's educational attainment, having own house, and having a housing loan are used as present home background.

④ Past condition of daughter i ($Past_i$)

Set of control variables are educational attainment of the father, number of siblings, if the woman is the first child or not, and experience of being abused are used as proxy variables for family background during daughter i's childhood.

Note that, in the model, annual income and women's education are taken as exogenously given. In general, as Tanaka (2008) mentions, these variables depend on other family background characteristics such as paternal employment status and occupation. In the empirical analysis, I include father's education as an additional

explanatory variable. This is done to address the dependence of family background on the father's income and occupation; however, this survey does not include data for father's annual income or occupation when the respondent was a child. When I examine women's working decision at one and three years after the first childbirth, the control variables below are omitted because the data does not include these pieces of information at that time: number of children, age of the youngest child, co-residence (or approximate) with parents or not, annual income, husband's annual income, having own house, and having a housing loan.

2.5 Results

2.5.1 Perception of Gender Division of Household Labor

In this subsection, I examined whether having a working mother during women's childhood affects the women's perception of gender division of household labor. The hypothesis here is that the daughter's perception of gender division of household labor is affected by having a working mother during her childhood in accordance with the previous studies.

<Table 2.3 to be Inserted Here>

The relationship between the woman's perception of gender division of household labor and the mother's decision regarding employment, whether to work or not, when the woman was a child, is shown in Table 2.3. Six models were examined: in model (1) no variable is controlled; in model (2) all of the control variables mentioned in the empirical strategy (except for education, husband's wage and woman's wage) are controlled; in model (3) education is also controlled; in model (4) husband's wage is added as a control variable to model (3); in model (5) woman's wage is added as a control model for model (3); and in model (6) both husband's and women's wages are added to model (3).

For women whose mother was working at the age of three, the probability of women being in favor of gender division of household labor decreases by 3.65 to 4.29 percentage points. Having a working mother when the woman was aged six also decreases the probability by 3.61 to 5.53 percentage points, and working mothers of women at the age of twelve reduces the probability by 5.15 to 3.9 percentage points. Although I control the models for education and wages, the impact of the working mother during woman's childhood remains.

<Table 2.4 to be Inserted Here>

Next, I examine whether mother's employment style, full-time or part-time, during the woman's childhood, affects the perception of gender division of household labor. The results are shown in Table 2.4. Three models are examined: in model (1) all of the control variables mentioned in the empirical strategy (except for education, husband's wage and woman's wage) are controlled; in model (2) education is also controlled; in model (3) both husband's and women's wages are added to model (2). The probability of women being in favor of gender division of household labor declines when the woman's mother worked full-time at the woman's age of three by 4.84 percentage points, and at the daughter's age of six by 4.66 percent points. When the mother working full-time at the daughter's age of twelve, the impact was not statistically significant. Having a mother who used to work part-time at the woman's age of three reduces the probability of women to be in favor of labor division of household labor by 5.29 percentage points if the effect of education is not controlled. However, when the effect of education is controlled, the impact is no longer statistically significant. Panel B, a woman at the age of three, and Panel C, at the age of twelve,

have the similar trends. Compared to mother working full-time, the impact of mother working part-time is smaller.

<Table 2.5 to be Inserted Here>

Finally, I examine when the most effective time for mother to return to work is: at the ages of three, six or twelve? The results are shown in Table 2.5. The perception of gender division of household labor is affected the most by the mother working at the daughter's age of three. The probability of daughter being in favor of gender division of household labor decreases by 5.98 to 4.43 percentage points. At other ages, the impact is not statistically significant. However, when I control the effect of the women's wage, the impact of having a working mother at any age is no longer statistically significant. The working mother's effect on daughter's perception of gender division of household labor is smaller than the daughter's recent wage.

According to the results, a woman that had a working mother tends to be in favor of work role model and vice versa. This effect is stronger when the mother used to work full-time. Furthermore, the effect is the strongest when the woman's mother worked at the age of three compared to other ages.

2.5.2 Working Decisions of One or Three years after First Childbirth

In this subsection, I examine whether working mothers during women's childhoods have impact on women's work-related decisions one year and three years after the first childbirth. One year after childbirth is the time when maternity leave is over and the woman needs to decide whether she would return to work. Three years after childbirth is the time when children usually go to kindergarten in Japan.

<Table 2.6 to be Inserted Here>

The relationship between the woman's work-related decision one or three years after the first childbirth and her mother's work-related decision, i.e. whether to return to work or not, when the woman was a child is shown in Table 2.6. Three models for the relationship between women's work-related decision one year after the first childbirth and having a working mother at the age of three, six and twelve are examined in models (1) to (3), and the case of three years after first child birth is examined in models (4) to (6). All the control variables are mentioned in the notes of Table 2.6.

Having a working mother at the age of three increases the probability of women working one year after the first childbirth by 16.8 percentage points.

Furthermore, having a working mother at the age of six increases the probability by 15.5 percentage points, and having a working mother at the age of twelve also increases the probability by 11.4 percentage points. Mother working at the woman's age of three, six and twelve also increases the probability that the woman would work three years after the first childbirth by 15.4 percentage points, 13.4 percentage points and 9.63 percentage points, respectively. Having a working mother during childhood affects women's early return to the labor force market.

<Table 2.7 to be Inserted Here>

Next, I examine whether the employment style, full-time or part-time, of the mother during the woman's childhood affects the early (re)entry to labor force market. The results are shown in Table 2.7. The models are the same as in Table 2.6. All the control variables are mentioned in notes of Table 2.6.

Mother working full-time at her daughter's age of three increases the probability of women working one year after the first childbirth by 16.6 percentage points. Mother working full-time at the daughter's ages of six and twelve increases the probability by 17.3 and 15.4 percentage points, respectively. In contrast, mother

working part-time at the daughter's ages of three, six and twelve increases the probability of women's working one year after first childbirth by 18.4, 13.4 and 6.87 percentage points, respectively.

Mother's employment style - both full-time and part-time - have positive impact on the women's early (re)entry to labor market. Especially, the impact of the mother working full-time affects the woman more than mother's part-time work. The impact is more than twice as large.

<Table 2.8 to be Inserted Here>

Finally, I examine at which age is the mother's employment most effective, age three, six or twelve. The results are shown in Table 2.8. The women working one and three years after the first childbirth are affected by their mother working, especially if they worked when they were three years old. Having a working mother at the age of three increases the probability of women working one year after the first childbirth by 18.8 to 16.8 percentage points, and the mother working at the woman's age of six also increases the probability by 5.41 to 7.61 percentage points. On the other hand, the mother working at the women's age of twelve is not statistically significant. I also

examine the impact on the probability of women working three years after the first childbirth. Having a working mother at the age of three increases the probability of working three years after the first childbirth by 14.8 percentage points to 16.1 percentage points. On the other hand, the impact of having a working mother at six and twelve years of age is not statistically significant.

A woman's return to labor force market one or three years after the first childbirth is affected by having a working mother during the woman's childhood. A woman whose mother worked is more likely to work one year after the first childbirth when the maternity leave is over, and also three years after the first childbirth when the child starts kindergarten. The effect is stronger if the mother worked full-time, especially at the daughter's age of three. The effect is the strongest when the mother worked at the daughter's age of three. Women's work-related decision three years after the first childbirth is affected by having a working mother at the age of three and the effects are not statistically significant when the mother worked at the ages of six and twelve.

2.5.3 Continuing to work since graduation from school

In the final subsection, I examine the long-term effect and impact of having a working mother during childhood on women's continuing to work after graduation from school. In Japan, once a woman leaves her job, it is very difficult to come back to labor market. Over 90 % of Japanese women start to work full-time after graduation, so it is best to keep that first job; however very few people get the best job from the beginning. Therefore, in this subsection, my definition of "continuing to work" is understood in more generous terms. Even though a woman changes her job, if she continues to work after graduation from school until now, I consider this to mean "continuing to work."

<Table 2.9 to be Inserted Here>

The relationship between women's continuing to work after graduation and her mother's work status, such as working or not working and working full-time or part-time, when the daughter was three, six and twelve are shown in Table 2.9. Three models for the impact of having a working mother at the ages of three, six and twelve and having a working mother employed full-time or part-time at the ages of three, six and twelve are examined respectively. All the control variables are mentioned in Notes.

Having a mother working at the age of three and six increases, the probability that the woman would continue to work after graduation from school until now by 6.2 and by 4.52 percentage points, respectively. On the other hand, at the age of six, the impact is not statistically significant. Women more likely to continue working after graduation from school when their mothers worked full-time. The probabilities are by 8.11, 6.16, and 6.16 percentage points at the ages three, six and twelve, respectively. On the other hand, when the mother worked part-time during the woman's childhood, the impact is not statistically significant.

<Table 2.10 to be Inserted Here>

Finally, I examine when it is the most effective for the mother to return to work, at the daughter's age of three, six or twelve. The results are shown in Table 2.10. Two models are examined: in model (1) the effect of all control variables mentioned in the empirical strategy (except for education) are controlled; in model (2) education is added to control. The variable of women continuing to work after graduation from school until now is affected the most by having a working mother at the age of three. The mother increases the probability of the woman to continue to work by 8.48 to 8.65

percentage points. When the mother returned to work at the ages of six and twelve, the effect was not statistically significant.

Unlike other estimates such as the perception of gender division of household labor and women's return to the labor market one and three years after the first childbirth, the effect of women continuing to work has a smaller impact. However, the impact of a working mother at the age of three is still statistically significant and has a positive long-term effect. This implies that although the daughter does not remember, the mother might talk about her life when the daughter was small and this may affect her decisions when she grows up.

2.6. Conclusion

This study examines the existence of intergenerational linkage between mother and daughter in terms of employment. The results show that: 1) a woman is less likely to be in favor of gender division of household labor; 2) more likely to (re)enter the labor force; and 3) more likely to work after graduation from school if the mother was working during her daughter's childhood. In this study, I conduct logistic analysis with sampling weights on the data from the National Survey of Households with Children from 2012 and 2014.

The analysis of the data indicates that the mother that had been working during her daughter's childhood affects her perception of the gender division of household labor; a woman who had a working mother during childhood is more likely to be in favor of the work roles than if her mother had not been working. This effect is stronger when the mother was working full-time. Moreover, among ages three, six, and twelve, the effect is the strongest when the woman's mother was working at the daughter's age of three.

Women (re)joining the labor market one or three years after the first childbirth are also affected by the mother working during their daughter's childhood. A woman who had a working mother during childhood is more likely to be working one year after the first childbirth (when maternity leave ends), and also three years after the first childbirth (when the child enters kindergarten). The effect is stronger if the mother was working full-time. The effect is likewise strongest when the mother was working at her daughter's age of three. A woman's work status three years after the first childbirth is positively affected by having a mother working at the daughter's age of three.

Ultimately, the impact on women that are continuing to work and who had a working mother during their childhood is not as strong on perception of gender division of household labor or on the early (re)joining of the labor market. Nevertheless, the

impact of mother working at her daughter's age of three is still statistically significant and has a positive impact. The findings could be interpreted as though the daughter might not remember that period, the mothers might talk about the family's situation when the daughter was very young, which could have affected the daughter's attitude toward work when she grew up to be a mother herself.

This empirical evidence suggests intergenerational linkage between mother and daughter regarding employment. It also suggests that the decision of a woman with no childcare experience as to whether to work when her child is very young is affected by her mother's employment style during daughter's childhood. Although the Japanese government has a set of childcare support systems in place, they might not be effectively utilized since, according to results, generally a woman's work role model is her mother, who had made working decisions one generation before, at a time when economic conditions and childcare support system were different from those of today. Women's work-related decisions after pregnancy and childbirth might impact other experienced working women of the same generation as to how they arrange their lives after childbirth.

In order to utilize childcare support systems in line with current lifestyles, women need to obtain information from women of relatively close age who have

already experienced childbirth and childcare about what kind of support they used before and after childbirth, and what kind of time constraints women are supposed to assume to balance work and personal life. According to findings, this information needs to preferably be acquired before pregnancy or childbirth. One suggestion may be to obtain guidance from the more experienced working women for this purpose. It may also be possible to organize workshops with them in order to prepare young women in advance as to how to balance personal and professional life before and after childbirth.

Chapter 3 First-Grade Shock: Women's Work-Life Conflict in Japan

3.1 Introduction

The phenomenon of "first-grade shock" first appeared in a Japanese magazine named Asahi Shimbun weekly AERA[3] in the October 17 issue of 2005 describing the adversity of mothers who find it difficult to balance child rearing and career once their children enter first grade. The term started to receive public attention in 2014, when Prime Minister Shinzo Abe mentioned it in his policy speech (Nikkei 2014a).[4] In his speech, Prime Minister Abe proclaimed "an aim for a society where women can play an active role" and promised that the government would accelerate a comprehensive support plan for after-school programs and lower the "wall of the first grade". First-grade shock also appeared in the "White Paper on declining birthrate, 2015" written by the Cabinet Office and Amano (2015) and was pointed to as one of major reasons behind the stagnating participation of married women in the labor force.

The definition of first-grade shock differs among governments, nonprofit organizations (NPOs), and the media. According to the Cabinet Office (2015), "first-grade shock" implies a situation where mothers involuntarily experience career interruption due to an increased childcare burden when their children enter primary

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[3] AERA stands for "Asahi Shimbun Extra Research and Analysis".

[4] Nikkei. 2014a. "The Wakeup Call for Japan's Potential" Prime Minister's Message. *Japan Economic Journal.* Sept. 29th. 2004 https://www.nikkei.com/article/DGXLZO77681430Z20C14A9EAF000/(in Japanese)

school. Other NPOs, pressure groups, and media use the term as a more comprehensive concept implying work-life conflict of mothers with school-aged children. Japan's primary schools demand a considerable amount of responsibility and tasks on behalf of parents (mostly mothers), thereby exacerbating a mother's physical and mental burden (Yomiuri 2015).[5]

In this paper, we empirically show the existence of first-grade shock in Japan for the first time in the literature. We benefit from unique data from Japan containing detailed information about Japanese mothers' employment emotional distress, perceived work-life conflict, and concerns about their own children. We first show that mothers' employment as part-time workers increases during the year their youngest children start first grade in elementary school. However, increased employment also coincides with an increase in the number of mothers with depression. Mothers also report a decreased amount of housework shared by their husbands and increased work-life conflict.

Next, we observe that mothers' employment level decreases to the level when their children were in preschool. At the same time, emotional distress and a mother's perception of work-life conflict also return to preschool levels.

Our results indicate that mothers try to re-enter labor market once their children enter elementary school. However, they are soon faced with work-life conflict caused by the increased burden of child rearing and lack of support from their husbands and society. The work-life conflict experienced by mothers increases the probability of

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[5] Yomiuri. 2015. "Ryoritsu habamu 'shoichi no kabe'." ("First-grade shock" to prevent work-life balance.) *YOMIURI ONLINE.* May 26th.

https://www.yomiuri.co.jp/feature/matome/20150527-OYT8T50035.html (in Japanese)

emotional depression by 7.64% point, forcing them to eventually quit their job the following year. We also provide suggestive evidence that part of a mother's burden stems from concerns about her children's educational achievement and adaptation to school life.

Our paper is in line with the literature showing the importance of parental involvement in children's schooling and educational attainment. Dudley-Marling (2001) and Holloway (2006) analyzed cases in the United States, Canada, and Japan and showed that mothers bear an emotional burden when their children show poor performance in school. Hutchison (2012) analyzed videotaped interactions between mothers and their children and claimed that support for children's homework largely falls on mothers. North (2009) reported that the burden of family work in Japan falls disproportionately on women, even in dual-income families.

There has been a growing literature on the impact of subsidized childcare and women's labor market participation. Some studies found that a subsidized kindergarten has no impact on maternal labor supply (Cascio, 2009; Havnes and Mogstad, 2011; Asai et al., 2015). However, according to other studies, subsidized childcare has a large positive impact on maternal labor supply, especially when combined with full-time public kindergarten (Lefebvre and Merrigan, 2008; Haeck et al., 2015; Givord and Marbot, 2015; Nollenberger and Rodriguez-Planas, 2015). Our paper contributes to the literature by showing that after-school childcare system, as well as a subsidy for preschool childcare, is important to maternal labor supply and a mother's work-life conflict.

This paper is organized as follows. In section 2, we provide a detailed description of the childcare system and women's labor market participation in Japan. In

section 3, we review the relevant literature on the impact of family policies and women's labor market participation. We also overview the literature related to parenting, unequal gender roles, and mothers' burden in parenting. In section 4, we introduce our data and empirical strategy. In section 5, we present our empirical results and provide an interpretation. We conclude in section 6.

3.2 First-grade shock and the childcare system in Japan

3.2.1 Nursery school vs. after-school care programs in Japan

As more mothers continue to work, the lack of nursery care facilities has become an urgent social problem in Japan. However, when tackling with this problem, the government has mainly focused on preschool children and left aside school children. As a result, a mother's time constraints become tighter when children enter elementary school.

In the 2006 fiscal year, for example, the number of preschool children who could not enter day care facilities totaled 19,794 (The Ministry of Health, Labor, and Welfare, 2006). There are also potential children on waiting lists who attend undesirable facilities far from both home and public transportation and who have siblings in a different day care facility.

In 2012, Japan started the "zero waiting list plan" to further increase its number of facilities. As a result, the number of children that nursery schools can accommodate increased from 2.1 million in 2007 to 2.4 million in 2012 (The Ministry of Health, Labor and Welfare 2017a). In 2015, the government began to subsidize the "in-house" preschool day-care facilities, allowing various forms of day care, including

kindergarten-type facilities. Lastly, in 2017, the number of children accepted reached 2.8 million (The Ministry of Health, Labor and Welfare 2017b). In 2018, local governments were allowed to set up their own criteria to increase the nursery facilities and meet local demand. Under this new system, Tokyo city began to subsidize facilities if they were located near train stations and remained open until 9:00 pm (Tokyo 2018). The after-school childcare program, however, has not received enough attention from the government. According to the Ministry of Health, Labor, and Welfare, the number of school children using after-school care programs in 2007 was 794,922. This number steadily increased and reached 1,093,185 in 2017. However, it has been pointed out by the media that the shortage of after-school care programs is the major source of first-grade shock in Japan (Nikkei 2014b)[6].

In 2007, only 62.2% of children who graduated from nursery school could join after-school childcare programs (Social Security Council 2008). Nikkei (2018[7]) reported that some school children, faced with a shortage of after-school care programs, have no choice but to attend preschool nursery facilities. After-school childcare facilities often close quite early, providing insufficient support for working mothers. In 2016, approximately 25% of facilities closed before 6:00 p.m., and only 7.3% were open after 7:00 p.m. on weekdays (Ministry of Health, Labor, and Welfare 2016). The locations of after-school childcare facilities are also not convenient for preschool

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[6] Nikkei. 2014b. "'Shoichinokabe' tte nani? Syugakugomo kodomono azukesaki fusoku." (What is 'First-grade shock'? Lack of afterschool programs for children after enrollment of school.) *Japan Economic Journal.* Aug. 25th. https://www.nikkei.com/article/DGKDZO76111280V20C14A8EAC000/ (in Japanese)

[7] Nikkei. 2018. "Shogakusei Hoikuenni 'Tadaima' Taikijido dokode sugosu." (Elementary school students saying "I'm home" at the afterschool nursery. Where to stay for school children listed on waiting.) *Japan Economic Journal.* Jan. 16th. https://www.nikkei.com/article/DGKKZO25732870W8A110C1KNTP00/ (in Japanese)

nursery schools. Approximately 53.7% of facilities are located on school premises, which are usually far from train stations, thus increasing female workers' time constraints compared to preschool years.

3.2.2 Women's labor force participation in Japan

<Figure 3.1 to be Inserted Here>

Figure 3.1 shows women's labor force participation rates by age group from 1975 to 2013 in Japan (Cabinet Office 2014). It shows a clear M-shaped curve in 1975, indicating that Japanese women in their late 20s and 30s left the labor force due to childcare burdens and re-entered it when they reached their 40s. The M-shaped curve softens into a gentle curve in 2013. The overall level of labor force participation also increased over four decades. In 1975, women in their early 20s show the highest level of labor force participation rate, reaching 66.2. In 2014, the highest level of labor force participation is among women in their late 20s, increasing to 73.

<Figure 3.2 to be Inserted Here>

Figure 3.2 shows the trends of female labor force participation rates by age group and marital status in 1975, 1995, and 2013. Though the overall level of workforce participation in each group increased over time, a significant gap between married and single women remains, even in 2013. In 1975, single women in their early 30s count for approximately 80% of the labor force participation rate, while that of married women is

approximately 40%. In 2013, 90% of single women in their early 30s participated in the labor force, while only 57.9% of married women remained in the labor force. The gap decreased from 49% point to 32.4% point during four decades, implying very little improvement in the impact of having children on women's labor supply.

3.3 Literature Review

3.3.1 Maternity Leave and Women's Labor Market Participation

Most advanced countries these days have family policies which are expected to encourage women's labor market participation. Maternity leave (or parental leave) allows mothers to temporarily leave their jobs, while the public childcare system (or subsidized childcare) tries to reduce the burden of childcare and enables women to balance child rearing and work. Both policies and their economic consequences are well studied in the literature.

Blau and Kahn (2013) performed cross-country analyses on family policies to examine why the labor force participation rate of US women is lower than that of women in other OECD countries. They found that the length of parental leave has no impact on women's labor force participation, while the right to part-time work and equal treatment significantly increase women's labor force participation. However, Blau and Kahn (2013) also noticed that these family policies may reduce women's representation in full-time and professional jobs, which require career-long commitments. Olivetti and Petrongolo (2017) also show that a country with job-protected leave and an early childhood education and care system tends to have a higher level of female employment.

Studies using microlevel data provide detailed stories focusing on each country's specific reform and context. Lalive and Zweimüller (2009) examined Germany's change in parental leave in 1990 and 1996 regarding fertility and women's return to work. Their empirical study demonstrates that increased parental leave encouraged women to have a second child and eventually lowered the rate of women returning to work. Schönberg and Ludsteck (2014) also examined five major extensions in maternity leave in Germany and claimed that policy change brought a reduction in a mother's post birth employment rates in the short run, while there was no meaningful impact in the long run. A potentially negative impact of prolonged maternity leave is also reported in Japan. Takao et al. (2013) used confidential personnel records from a large manufacturing company in Japan to show that there is a significant level of wage penalty for married women. They then found that women were more likely to be promoted when working long hours, while no such correlation was found among male workers. They also showed that women who return from maternity leave quickly can avoid such a penalty as a mother. These findings can be interpreted as illustrating the importance of women's ability to show their level of commitment to work rather than enjoying maternity benefits.

3.3.2 Subsidized Childcare and Women's Labor Market Participation

Subsidized childcare or public childcare systems have expanded in many advanced countries over the last several decades. The purpose of such a policy is often to provide children with better education and to encourage a mother's labor market participation. However, empirical evidence in the literature shows that not all types of policy have a positive impact on maternal labor supply.

Cascio (2009) examined the impact of subsidized kindergartens on maternal labor supply. Results show that the impact of such a subsidy is limited to single mothers. Havnes and Mogstad (2011) investigated the expansion of subsidized universal childcare in Norway and its impact on maternal employment. They also found a limited impact of such a policy on a mother's employment, while subsidized public childcare crowds out informal childcare arrangements.

The study by Lefebvre and Merrigan (2008) provides important empirical evidence that childcare subsidy, combined with the expansion of full-time public kindergartens, has a large impact on maternal labor supply. In 1997, the government of Québec in Canada introduced a new childcare policy which reduced fees to $5 per day per child. In addition, for children aged 5 on September 1997, free full-day rather than part-day care was offered. Their findings show that a generous and almost-free public childcare system can have a substantial impact on a mother's employment. Haeck, Lefebvre, and Merrigan (2015) reported the long-term impact of Québec's subsidized childcare policy, showing that full-day kindergarten with a low-fee daycare program had a long-lasting impact on maternal labor supply. They also found that such a policy did not improve cognitive development, especially among children from low-income families.

In other countries, studies show the moderate impact of childcare subsidy on maternal labor supply. Givord and Marbot (2015) studied the gap in childcare subsidies in France related to the child's birth year. Their estimation shows an increased use of paid childcare services and a moderate impact on a mother's employment. Nollenberger and Rodrìguez-Planas (2015) estimated the impact of full-time, public childcare in a low-demand context for labor in Spain. They found that the policy increases a mother's

employment by 9.6%, driven mostly by women with completed fertility. In Japan, Asai et al. (2015), using prefecture panel data, found that childcare has no impact on maternal employment once prefecture fixed-effects are controlled. Their evidence suggests that childcare services crowd out informal childcare, such as support from grandparents.

3.3.3 Parenting and the Mother's Burden

Although most policies targeting child development and a mother's employment focus on preschool and maternity leave (parental leave), the literature suggest that parental involvement in children's schooling plays an important role in their educational attainment. It has also been shown that such a responsibility often falls to the mother, who assumes both the material and emotional burdens.

Dudley-Marling (2001) conducted in-depth interviews with mothers with school-aged children and claim that mothers with poorly performing children often feel a great emotional burden. Hutchison (2012) analyzed videotaped homework interactions between mothers and their children. They claim that most parental involvement and support for children's homework largely falls to mothers. They argue that a mother's emotional investment in education is significant.

In Japan, the literature reports that women to a large degree are expected to invest in the role of mother. In addition, Japanese women show a higher level of life satisfaction when they self-assess as an efficient parent who can support, teach, and understand their own children (Holloway et al. (2006)). North (2009) reported that the burden of family work in Japan falls disproportionately on women, even those with full-time jobs. The paper surveyed the time-use of dual-income Japanese families with

young children and found that women spend around four times more time on family work compared to their husbands.

3.4 Data and Empirical Specifications

3.4.1 Data and Descriptive Statistics

We utilize the National Survey of Households with Children (*Kosodate Setai Zenkoku Chōsa*) （JILPT 2013, JILPT 2015）conducted in November of 2012 and 2014 by the Japan Institute for Labor Policy and Training. The survey is nationally representative and designed using a two-stage clustered sampling with stratification based on basic resident registry. Interviewers visited each respondent's residence and then submitted a completed questionnaire according to a prespecified schedule to ensure accuracy of data.

In each year, two-stage stratified sampling based on data from the Basic Resident Registry (*jūmin kihon daichō*) produced a target sample of 4,000 of both two-parent and single-parent households. Interviewers delivered a self-administered questionnaire to respondents' homes and returned to collect the completed questionnaires at a pre-specified date and time. The valid responses are 2,201 samples in 2012 and 2,197 samples in 2014.

They survey contains information about both parents and their children under 18. The data are unique, as they providing detailed and comprehensive information on mothers, such as depression index, their own evaluation of work-life conflict, housework share, and their concerns about their children's educational attainment, behavioral issues, and school difficulties. The data also provide detailed information

about parents' employment, work schedule, attained education, and proximity to their own parents and in-laws. We restrict our sample to mothers with children aged three to eleven to identify first-grade shock.

<Table 3.1 to be Inserted Here>

Table 1 shows that 64.9% of mothers with preschool children work outside the home, and 31.7% of all mothers work as part-timers in the case of the female workers with preschool children. On the other hand, 76.5% of females work outside the home and 41.7% are part-timers in the case of mothers with elementary school children. This shows that mothers with elementary school children tend to work more than mothers with preschool children; however, most of the time they are part-time workers. In both cases, less than 15% of mothers work in irregular schedules. In our data, 38.5% of nonworking mothers reported that a conflict in working hours is the main reason for not working.

The share of mothers who reported exercising strict discipline is higher among those with elementary school children (51.9%) than those with preschool children (46.6%). Mothers with elementary school children are more concerned about children's characteristics and habits, educational achievement, and the possibility of bullying. Mothers with elementary school children are also more likely to report that they are too tired to do housework (55.3%) and face long working hours (40.3%) compared to mothers with preschool children (45.7% and 34.6%). When we evaluate the level of emotional distress using the CES-D scale, 10.1% of mothers with elementary school children experienced depression, as did 7.7% of mothers with preschool children.

Mothers with elementary school children also reported that the share of housework done by the husband amounts to only 0.8%. Their perception of equal housework sharing is very low compared to mothers with preschool children (28.9%).

We also have detailed demographics on mothers: their age, the sex of their first and their youngest children, education, and their husband's wage. The data also provide information about how much support they get from their parents (in law). The share of mothers who receive childcare support from parents decreases from 53.9% when they have preschool children to 43.8% when they have elementary school children. The share of mothers who receive financial support from their parents also slightly declines from 19.7% to 17.6%. As these supports may affect our outcome variables, such as work-life conflict, emotional distress, and concerns about children, we later control all these variables in our estimation.

3.4.2 Empirical Specifications

We aim to examine how first-grade shock affected a mother's employment, her own evaluation of work-life balance, and her emotional burden in terms of parenting. There are two major channels whereby children's entrance into the first grade would affect their mothers: tightened time constraints and increased demand for parenting. The elementary school day ends earlier than the nursery school day in Japan and this restricts a mother's flexibility in time use. A huge demand for after-school care programs also indirectly supports a mother's time constraint. In addition, elementary school requires mothers to support their children's homework, educational attainments and appropriate behavior in school.

To discover whether mothers experience a sudden jump in their employment, we examine their emotional burden when their child enters elementary school. To estimate this first-grade shock, we employ following framework,

$$Y_{ijt} = \beta_0 + \beta_1 First_{ijt} + \beta_2 Cohort_j + \beta_3 Year_t + \beta_4 Controls_{ijt} + \varepsilon_{ijt} \qquad (1)$$

where Y_{ijt} indicates the outcome variable of mother "i" with children born in year "j" in survey year "t". $First_{ijt}$ is an indicator of whether a mother's youngest (or eldest) children born in year "j" passed the first grade in survey year "t". The coefficient β_1 captures whether mother's labor market participation and work-life balance indicators show a structural break around their children's entrance into elementary school. $Cohort_j$ is included to control for any common characteristics or legal system shared among children born in the same year, while $Year_t$ picks up any time trends affecting labor market environment for mothers in each survey year. $Controls_{ijt}$ is a set of variables that includes characteristics of each mother, her children, and her husband.

To further examine the persistence of first-grade shock, we utilize the following framework, which is extended from equation (1),

$$Y_{ijt} = \beta_0 + \sum_{k=1}^{6} \beta_k Grade_{ijt}^k + \gamma_1 Cohort_j + \gamma_2 Year_t + \delta Controls_{ijt} + \varepsilon_{ijt} \qquad (2)$$

where $Grade_{ijt}^k$, is an indicator of whether the children of mother "i" born in year "j" are in $Grade^k$ in year t. β_k shows how women's outcomes change by children

becoming jth graders to see how the results are changed. This framework allows us to examine whether first-grade shock has any persistent component for several years.

The set of control variables in equations (1) and (2) includes sex of child, mother's age, mother's years of education, and husband's wage. We also control for several variables, for example whether they receive private support from their own parents or parents-in-law. Such variables include indicators as to whether they are living close to parents (or parents-in-law), have private childcare support, and financial support. For precise definitions and detailed explanations, please refer to Table A in the Appendix.

3.5 Results and Interpretation

3.5.1 First-Grade Shock and a Mother's Employment

<Table 3.2 to be Inserted Here>

In 3.5.1, we examine how children entering elementary school affects a mother's employment. Table 3.2 shows whether mothers are more likely to be employed once their children enter the first grade. Regressions (1)-(3) in Panel A examine the impact of the first child entering first grade, while regressions (4)-(6) examine the impact of the youngest child entering first grade. Regression results show that school entrance of the first child has no impact on a mother's employment when we control for husband's wage, living arrangement and other support from their own parents. However, when we examine the impact of the youngest child entering first

grade, we find a positive and significant impact on a mother's employment. Regressions (4)-(6) in Panel A show that a mothers' increase in employment ranges from 26.5% point to 35.9% point once her youngest children enter elementary school. This is consistent with the common observation that mothers who left the workforce for childbirth tend to re-enter the labor market once the children enter a formal school. In addition, our results show that a return to the work force can be observed only among women with completed fertility.

In Panel B, we explored first-grade shock and mother employment type: working as a part-time worker and working with an irregular work schedule among all mothers. In these regressions, we examined only the impact of first-grade shock in the case of the youngest child. Regressions (1)-(3) in Panel B show that the impact of first-grade shock on women's employment as part-time workers ranges from 24.4% point to 29.5% point. This implies that most women who re-enter the labor force return as part-time workers. However, regressions (4)-(6) show that they do not return as workers with irregular work schedules.

<Table 3.3 to be Inserted Here>

<Table 3.4 to be Inserted Here>

In Table 3.3, we investigated whether first-grade shock is persistent from two year before the child is in elementary school throughout in elementary school. In Panel A, regressions (1)-(3) confirm our previous finding that women do not re-enter the labor market when their first child enters elementary school. Regressions (4)-(6) show the case of a youngest child entering first grade. Estimated coefficients show that women's

labor market participation significantly increases from 14.6% to 18.2% point one year before the first grade and from 17.3% to 23.5% point in the first grade. The impact of the first grade is larger compared to the impact of one year before the first grade. However, temporarily increased labor market participation becomes statistically no different from that during the preschool period. The results are consistent when we examine the type of work in Panel B in Table 4. Women re-enter the labor market as part-time workers with regular work schedules significantly increases by 18.7% to 20.3% points during the year of the first grade, which is the largest in any other grades.

3.5.2 First-Grade Shock and a Mother's Emotional Burden

In this subsection, we examined whether first-grade shock affects a mother's emotional burden measured by the depression index. The depression index used for this survey is from The Center for Epidemiologic Studies Depression Scale (CES-D Scale), which was developed for use in studies of depression in the general population. The relevant questionnaire questions were selected from a pool of items from previously validated depression scales (Radloff 1977). Scores range from 0 to 60, and the higher the score, the greater the depression. When the score exceeds 16, the individual is regarded as having clinical depression. Out of 20 sub-questions developed by Radloff (1977), JILPT surveyed 7 questions translated into Japanese. Next, these items were graded depending on frequency, with a higher score implying a higher level of depression. We choose a cut-off point of 10, and a range from 0 to 21, to construct the depression binary indicator employed in Zhou 2016, which is rather strict compared to Radloff's cut-off point of 16 out of 60.

<Table 3.5 to be Inserted Here>

Table 3.5 shows whether mothers are likely to experience emotional distress once their children enter elementary school. We found a significant and sizable impact. Regression (1) shows that mothers are 11.8% point more likely to experience emotional distress once their child starts first grade. The impact only moderately declines when we control for their husband's wage, living arrangement, and other support from their own parents.

In the lower panel, we examine potential sources of increased distress: husband's share of housework, tiredness, and work-life conflict. These indicators are subjective answers reported by respondents reflecting their perception. For example, one question asked, "How much does your husband share housework, including childcare? Please write down from 0 to 10, where 0 implies the husband does nothing and 10 implies he does all the work." We then calculated normalized scores by subtracting each score by its average and dividing it by standard deviation. Regression (1) demonstrates that husband's share of housework declines by 0.633 standard deviation once their youngest children enters the first grade. The coefficient remains significant when we control for husband's wage, living arrangement and other support from their own parents.

We also tested other indicators of work-life conflict in regressions (3)-(6) in the lower panel. The results consistently imply that mothers start to feel the heavy burden of doing both housework and work at the same time. They are 25.5% point more likely to report that they are too tired to do housework (regression 4) and 19.6% point more likely report that their working time is too long to do housework (regression 6).

All these results indicate that mothers are under significant time constraints and carry the emotional burden of balancing housework and career at the same time. First-grade shock implies that mothers start to return to work; however, it also implies the considerable work-life conflict these mothers experience.

<Table 3.6 to be Inserted Here>

Table 3.6 examined the persistence of first-grade shock on depression and work-life conflicts previously examined in Table 5. Depression increases by 10.5% point during the year of youngest child enters first grade; however, it remains statistically insignificant for the lower grades and upper grades. This result is consistent with other subjective outcome variables we test in regressions (2)-(4). Regression (2) shows that mothers during the first-grade year are more likely to report that their husband's share of housework significantly declined. However, we cannot see such a perception persisting in earlier and later years. The results are mostly similar to and consistent with reports of work-life conflict.

3.5.3 A Mother's Concerns about Children

Can concern about children's achievement in school be a major driving force in increasing the work-life conflict and emotional burden of mothers? In Japan, the role of parents and home education has been strongly emphasized as a policy since the late 1990s. In 2006, the parents' duties in the children's lives were explicitly described in

Basic Education Law Article 10[8]. Honda (2008) argues that Japanese mothers are under an increasing burden and responsibility for family education and various requests from the school. In Table 7 we further examine a mother's discipline and time use with children and her various concerns about her children's achievements.

<Table 3.7 to be Inserted Here>

In Table 3.7, we constructed four indicator variables regarding whether mothers reported that they are being strict, worrying about children's personality, educational achievement, and possibility of being bullied in school. Regressions (1) and (2) show whether mothers increase their level of discipline once children enter school in the case of their first child and youngest child, respectively. Regression (1) shows that mothers increase their level of discipline when their first child enters school, but not in case of younger ones. Regressions (3) and (4) provide us with similar information: mothers are worried about their children's personality or habits during the first-grade year but not in other years. In addition, they do not show such an increase in concern in the case of the youngest child.

Regressions (5) and (6) show that concern about educational achievement significantly increases when children enter the 6th grade in elementary school, rather than the first grade. Regressions (7) and (8) show that a mother's concern about children

[8] Article 10 in 2006 clearly mentions the duty of parents: "Parents and other guardians have the primary responsibility for educating their children and are required to acquire the necessary habits for living and to foster autonomy and develop a harmonious mind and body."

being bullied in school significantly increases by 6.16% point and 6.74% point in the case of first the child and youngest child, respectively.

Our empirical evidence in this subsection shows that part of a mother's increased distress is driven by a concern for her children's educational achievement and behavioral issues in school. Estimation results also imply that mothers with no prior experience in parenting may bear a more severe burden as a result of first-grade shock.

3.6 Conclusion

In this paper, we examined the existence of first-grade shock, whereby mothers are under a higher level of pressure due to work-life conflict once their children enter elementary school. We employed a difference-in-differences strategy to capture the first-grade effect, controlling for a mother's characteristics and for available informal childcare from grandparents.

We found that mothers re-enter the labor market as part-time workers in the year their youngest child enters elementary school. However, they also experience difficulties in obtaining support from husbands and in managing work-life conflict. Our empirical exercise further shows that mothers' increased labor market participation during the first-grade year does not last. Mothers' labor market participation rates drop to a level insignificantly different from that of the preschool period. Correspondingly, their reported difficulty in work-life balance also declines to the preschool level.

We examined a mother's level of distress and perceived work-life conflict. Empirical evidence shows the clear existence of an increase in a mother's emotional burden when her child is in the first year in school. We further explored mothers'

concerns about their children's various aspects. We found evidence to suggest that mothers' concern with their children's behavior and achievement in school could partly be the source of their emotional burden.

Our empirical evidence provides strong and consistent evidence of first-grade shock in Japan. The wall of first-grade shock and its emotional burden is serious enough to discourage women's labor market participation in later years. On the other hand, even though mothers expect the wall of the first-grade shock, it is often the case that they have no choice but to return to the labor market. One of the largest factors is mother's age. In Japan, as the labors become older, they find it very difficult to change jobs and to (re)join labor market. Especially in the case of women, it is difficult to find jobs even as a part timer when women become around forty. So some mothers might think that it is the last chance to (re)join labor market when the youngest child becomes the first grade. This is one of the reasons we can think of why mothers come back to work even though they have the wall of first-grade shock.

To prevent a mother's career interruption, this paper calls for immediate policies to attenuate first-grade shock. After-school childcare programs can loosen the tight time constraints mothers face and support their work-life balance. Mothers with no previous child rearing experience would experience less concern if they received proper mentoring or guidance regarding their children's first year. Lastly, yet importantly, child rearing and housework burdens should be equally distributed within the family.

Chapter 4 Prevalence of Long Working Hours and Women's Occupational Choice: Evidence from Japan and Korea

4.1 Introduction

Japan and Korea show significant gender gap in terms of economic activities, as compared with other developed countries. Both countries show persistent gap in gender wage, which can be largely explained by men and women's occupational differences. In this study, we show that long working hours in Korea and Japan affect women's occupational choice. We also show that the impact of long working hours on women is salient among Korean women with college degrees, while long working hours discourage labor market participation of women with children in Japan. Finally, we examine the impact of a gradual introduction of a 40-hour workweek system on women's occupational choice in Korea.

Blau and Kahn (2006) showed that occupational upgrading contributed to the improvement of women's relative wages in the 1980s, while an unknown factor contributed to a reduction in the gender wage gap in 1990s. Blau and Kahn (2017) pointed out that women's career interruptions and shorter hours can explain a significant part of the gender wage gap in high-skilled occupations. Blau and Kahn (2013) also claimed that policies supporting women's labor force participation actually drive women to take part-time employment, which leads to gender wage gap.

Cha (2013) further showed that an increasing trend of overwork leads to gender segregation in occupations. Moreover, Cha and Weeden (2014) showed that gender segregation across occupations contribute to the slow convergence of gender wages in the United States in recent times.

Bertrand et al (2010) revealed that long working hours are the key factor affecting gender wage gap among young professionals who have completed Master of Business Administration (MBA). They studied the career evolution of top US business school graduates and showed that women's career interruptions and different working hours (as compared with their male counterparts) that are associated with motherhood contribute to earnings differences by gender. Goldin and Katz (2011) also found similar results that underscore the importance of workplace flexibility among high-end professions in the fields of pharmacy, dentistry, law, and medicine and explain gender wage gap. Herr and Wolfram (2012) studied Harvard alumnae and documented that workplace inflexibility pushes highly educated women out of the labor force.

A fundamental reason why workplace flexibility affects women's involvement in the labor market and their earnings is the unequal burden of parenthood on mothers. Bianchi (2000) analyzed time-diary data and showed that women continue to perform more housework than their husbands do. Cortes and Pan (2019) exploited variations in overwork across occupations in the United States and showed that overwork negatively affects women's occupational choice.

Japan and Korea are notorious for their culture of long working hours that is deep-rooted in their job places. The concept of *karoshi* (death from overworking) originated in Japan and has spread to Taiwan and Korea since the early 1990s. Korea ranks second highest in terms of annual working hours among OECD countries. Long working hours is driven by work conventions that rely on signaling, hierarchy in the company, and the traditional gender division of labor. Women, who are faced with tighter time constraints, usually choose occupations with shorter working hours.

In Japan, Nemoto (2013) showed how long working hours, combined with gender stereotypes and managers' attitude that prioritizes work over personal and family lives, influence young women to opt out from work. Moreover, Boyles and Shibata (2013) showed that long working hours negatively affect working women's level of satisfaction. Naito and Wie (2018) showed how working women with a first-grade child experience emotional distress and eventually opt out from the workforce. In Korea, long working hours and its detrimental impact on health are well-documented. Jang et al. (2014) showed that employees who work long hours are more likely to have cardiovascular disease.

In spite of numerous studies regarding women's labor market involvement and workplace flexibility, the issue is not well-examined in Japan and Korea, which are countries with notoriously long working hours. Our findings indicate that long working hours negatively affect women's occupational choice in both countries, regardless of their education, marital status, and motherhood. We also show that the mandatory adoption of a 40-hour workweek system in Korea statistically increased women's employment in occupations that are under this regulation. This study contributes to the literature by providing additional empirical evidence from these two countries.

The paper is organized as follows. In section 2, we review some cultural and legal background of long working hours in Japan and Korea. In section 3, we present our data and empirical strategy. In section 4, we provide our estimation results and discuss our interpretation of these results. In section 5, we present our conclusions.

4.2 Background

Korean workers worked the longest among OECD countries in 2000 and the second longest in 2016. This trend did not change in 16 years. Meanwhile, the average working hours in Japan was close to the OECD average in 2000 and it decreased in 2016. In this section, we explain in detail the trend of long working hours and the cultural and social context behind this issue in both Korea and Japan.

<Figure 4.1 to be Inserted Here>

4.2.1 Long working hours and women's employment in Japan

Long working hours have long been one of the biggest problems concerning labor policies in Japan. According to the OECD, the total annual working hours in Japan was 1,821 hours in 2000 and 1,713 hours in 2016, which was close to the OECD average. Moreover, the Ministry of Health, Labor, and Welfare reported that the total working hours has been declining. From 1994 to 2007, the total annual working hours remained around 1,800 hours. Since the Lehman shock in 2008, the economy has been deteriorating, with the total annual working hours falling below 1,008 hours for the first time in year 2009. The total annual working hours has shown a steady decrease since then.

However, this decrease was due to the increase in part-time workers (Ministry of Health, Labor, and Welfare, 2018). Yamamoto and Kuroda (2014) further pointed out that this decreasing trend was also due to the introduction of the five-day workweek system, so even though the total working hours has been decreasing, the working hours

on weekdays have been increasing. Furthermore, since the working hours per week of full-time workers in the 2000s were almost the same as in the 1980s, the number of late-night workers on weekdays has increased. In addition, Yamamoto and Kuroda (2014) pointed out that the polarization between full-time and part-time working hours indicate an increase in the number of male workers who work less than 45 hours per week, as well as an increase in the number of male workers who work more than 60 hours per week. As a result, the number of full-time male workers who work more the 60 hours returned to the 1980s' level, which was before the time when the legally mandated working hours was lowered.

One of the reasons behind long working hours in Japan concerns "Japanese employment practices." This is the practice where long-term regular employment is maintained to accumulate skills and increase the productivity of workers mainly through in-house training (Yashiro 1997). Specifically, Japanese companies hire newly graduated young workers at the same time and train them for a long time within the company. Human resource investment costs are recovered after their productivity increases (Yamamoto 2014). Under such Japanese employment practices, employee dismissal and other restructuring are not carried out, even during recessions. Companies try to cope with business stagnation by adjusting working hours, not the number of workers. This means that companies hire a minimum number of regular workers so that they do not have to fire employees during periods of stagnation. As a result, long working hours are likely to be maintained (Yashiro 1997). Other reasons why the working hours in Japan are longer than that in Europe are 1) overwork and working during holidays are highly evaluated, 2: job specifications are not clear(Yamamoto and Kuroda 2014).

Meanwhile, long working hours in Japan do not match productivity. Yamamoto and Kuroda (2014) analyzed "overwork" by defining the concept in terms of working hours, hourly productivity (GDP per hour), preferred working hours, and health. They found that working hours are long, hourly productivity is lower among developed countries, and the workers' health suffers when they work long hours. Thus, they concluded that the Japanese work "too long."

One of the most harmful effects of such long working hours is damage to health. Abe (2010) found that the fixed sleeping time of male and female regular employees is small, and that the variation in working hours is adjusted for the length of sleep, not for other activities such as leisure or housework. Moreover, longer working hours, especially for unpaid overwork, increase the risk of mental health (Yamamoto and Kuroda 2014). They also found that long working hours have a negative impact on corporate performance, with a lag of two years. There is also the problem of *karoshi* in Japan. According to the Ministry of Health, Labor, and Welfare (2016), the number of suicides due to work problems was 2,207 in 2007, reaching a peak of 2,689 in 2011 and increasing to 2,159 in 2015. About 30% of workers commit suicide because of "fatigue from work."

Another problem with long working hours is that it is difficult for women to be recruited. Given the fact that long working hours are a common practice in Japan, it can be inferred that if women are employed as regular workers, they would be required to work in a "masculine" manner in male-dominated workplaces. As pointed out by Yamamoto (2014), in a situation where long working hours are taken for granted, women workers who do not want to work long hours lose opportunities to play an active role. In a workplace where women find it difficult to demonstrate their abilities, even if

companies try to hire women, they cannot achieve higher performance. In addition to the difficulty for women to show high performance, women need to signal their commitment to work. For women to continue working as regular employees, long working hours are used as a signal of commitment to work. The relationship between long working hours and promotion has positive correlation only for women, not for men (Kato, Kawaguchi, and Owan 2013). The impact of personnel transfer on promotions is also stronger for women, while women are more likely to accept less increase in income when promoted(Sato, Hashimoto, and Owan 2017). Thus, women need stronger commitment to work than men do to continue working full-time. It is also difficult for women who want to balance work and life. As a result, many women quit their jobs or choose part-time work because of conflicts between work and life.

From the abovementioned studies, we can infer that shorter working hours by men and the practice of work-life balance are necessary to encourage women to work actively.

Yamamoto (2018) examined the relationship between working hours and the promotion of women's participation in the workplace. The author found that the proportion of female full-time workers was significantly higher at companies with shorter working hours for male employees and the personnel manager. In other words, this study demonstrates that women are more likely to be employed regularly in companies where men work shorter hours on average. Moreover, Kawaguchi (2011) found that women were less active at companies where the average length of service of men is longer and those that have long-term employment systems. The author also found that women work more actively at companies with work-life balance and positive action policies. Furthermore, Kawaguchi and Nishitani (2011) examined the

relationship between female employment and the long-term employment systems and WLB policies and pointed out that these working policies affect female employment.

To achieve shorter working hours in Japan, the government established the Working Style Reform Implementation Plan in March 2017. In addition to rectifying long working hours, the government presented a variety of options for labor market reform, including flexible working styles; the promotion of telework and side jobs; balancing work and medical treatment for illness; promoting employment of women, young people, and the elderly; and accepting foreign human resources. In accordance with this plan, the Labor Standards Act was drastically revised in June 2018 for the first time in 70 years. The revised Labor Standards Act establishes the maximum limit for overwork with penal provisions. This system was introduced in April 2019 for large enterprises and will be introduced in April 2020 for small and medium-size enterprises.

4.2.3 Long Working Hours and the Introduction of the 40-hour Workweek System in Korea

In this section, we review the gradual adoption of the 40-hour workweek[9] system in Korea. As presented in Table B, the 40-hour workweek system was first implemented voluntarily in the finance sector in July, 2002. Two years later, the law was actually mandated for all firms with more than a thousand employees. Then, it was gradually expanded over time to firms of smaller size. In July 2011, the law finally expanded to all firms with more than five workers.

[9] In the media, the policy was referred to as the five-day workweek system rather than the 40-hour workweek system.

The adoption of the 40-hour workweek system has been considered as one of the influential policies that changed the Korean society in the early 2000s. Kim et al. (2018) reported that the adoption of the 40-hour workweek system in Korea positively affected people's visits and financial transfers to their own parents, especially among male workers. However, they did not find any significant impact on female workers. Moreover, Park et al. (2012) showed that the adoption of the 40-hour workweek system decreased the average number of hours; however, the share of workers who work more than 48 hours per week increased simultaneously. They claimed that the Korean government should not only monitor average working hours but also should identify and properly regulate workers who work more than 60 hours per week. A similar finding was reported by Uh (2011). Uh showed that although the reduction in legal working hours reduced the prescribed working hours, the actual share of overworked employees increased. However, the author also mentioned that the increase in the number of overworked employees was a temporary reaction to the adoption of the new workweek system. Kim and Lee (2018) examined the impact of the 40-hour workweek system on workers' average working hours and wages. They showed that the mandatory reduction in working hours decreased actual working hours without penalizing workers' wages.

Along with the adoption of the 40-hour workweek system in 2004 and the legal working hours set in 2004, the necessity of introducing a flexible working system has been widely discussed in Korea. However, the actual implementation of a flexible working system is very low. In 2007, only 4.6% of all firms reported that they have a flexible working system. On the whole, the Korean society successfully reduced its average working hour over the last decades. However, most business establishments

still do not have other types of workplace flexibility, such as flexible working time, availability of part-time jobs, or work from home practices.

4.3 Data and Empirical Specification

4.3.1 Data and Trends of Working Hours in Japan and Korea

We use data from the labor force survey in Korea and Japan from year 2002 to 2016. The labor force survey in Japan targets all people living[10] in Japan (Statistics Bureau, 2018a). The survey collects information from members of households who are aged 15 or older. The survey consists of a basic survey and a special survey[11] that contains detailed information on education and wages. We employ the basic survey and match it with the special survey.

The labor force survey in Korea is conducted and collected by Statistic Korea on a monthly basis using 1,737 census blocks. Additional information about young and old generations is collected in May, while data on non-paid workers and economically non-active people are collected in August. The survey is nationally representative, and its survey questions are consistent over several decades.

We restrict our sample to working men and women aged 18 to 55, with a total sample size of 667,575 people in Korea and 1,888,308 in Japan. As for the industry and occupation, we created consistent industry-occupation classifications across two countries as presented in Table A. Then, we calculate the women's occupational choice on these industry-occupation cells that are disaggregated by 18 industries and 10

[10] The survey excludes foreign diplomatic and consular corps, their family members, foreign military personnel, and their family members.

[11] The survey employs a rotating sample design. The basic survey is conducted on the same sample for two consecutive years, while the special survey is only collected in the second year.

occupational categories. This does not mean the share of women in each industry-occupational cell. This means the industry-occupational distribution of women in a certain demographic group, for example whole women, single women, etc.[12](Cortes and Pan 2016). So, for example, the occupational choice of whole women refers the share of women in each industry-occupational cell out of all women. This variable would be interpreted as "occupational choice" of women. The total industry and occupation cells employed in our analyses are 1,616 units in Korea and 2,012 units in Japan during our sample period from 2002 to 2016.

<Figure 4.2 to be Inserted Here>

In Figure 2 we present the average working hours calculated by gender in Japan and Korea. The figure shows that there is a huge gap in average working hours between men and women in Japan. This is due to the large share of Japanese women working part time. The average weekly working hours of Japanese and Korean men show similar levels and trends until 2011. Since then, the average working hours of Japanese men has become greater than that of Korean men as Korean men's working hour declined sharply after 2010.

<Figure 4.3 to be Inserted Here>

[12] Empirical models will be shown later.

In Figure 3, we present trends of overwork defined as the share of workers who work more than 50 hours per week. The share of overworked men was around 50% until 2005 and then constantly decreased to around 30% in 2016. Even among women workers in Korea, the share of overworked workers is higher. In 2002, the share of overworked women was around 40% in Korea; then, it declined to around 20% in 2016. In Japan, the share of overworked men only moderately declined during our sample period. The share of overworked Japanese men was around 40% in 2004 and reached around 35% in 2016. In 2013, the share of Japanese men who worked more than 50 hours exceeded that of Korea. In Japan, the gender gap in the share of overworked workers is much larger than that in Korea. Moreover, the share of women working more than 50 hours was slightly more than 10% in 2002, which slightly declined until 2016. From the figure, we can see that both genders in Korea are not considered overworked. In Japan, many women work part time, and this is likely due to the prevalence of overwork among male workers who work full time.

4.3.2 Empirical strategy

To examine the relationship between long working hours and women's occupational choice, we formally examine the relationship between mean working hour and the industry-occupation distribution of women in a certain demographic group (Cortes and Pan 2016) as follows:

$$\frac{women\_gr_{ict}}{women\_gr_{ct}} = \alpha + \beta_1 Working\ hour_{ict} + \beta_2 \frac{Others_{ict}}{Others_{ct}} + Control_{ict} + Cell_i + Country_C + Year_t + \varepsilon_{ict} \quad (1)$$

where i refers to an industry-occupation cell, t refers to the year, and c refers to the country. $women\_gr$ denotes women in a certain demographic group of interest who are currently working: all women, married women with children, single women, or college-educated women[13]. $\frac{women\_gr_{ict}}{women\_gr_{ct}}$ denotes the industry-occupational distribution of women. As information about children is only available in the Japanese data, we restrict our sample to Japanese women when we examine women with children. Our main variable of interest is $Working\ hour_{ict}$, measured as the average weekly working hours of men between age 18 and 55. We also divide weekly working hours by ten to increase the visibility of estimated coefficients. As such, β_1 captures the impact of a 10-hour increase in weekly working hours on women's occupational choice. All main variables and estimations were constructed and performed in consideration of the sampling weight and survey sampling design.

Moreover, we control for the occupational choice of other demographic groups, such as men, to control for industry-occupation specific demand shocks that could be correlated with long working hours and also affect women's occupational choice. The set of control variables includes average firm size and average annual wage[14]. We also include industry-occupation-cell-fixed effects, year-fixed effects, and country-fixed effects. ε_{ict} refers to an error term that is clustered within each industry.

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[13] For all working women, we restrict our sample to those aged between 18 and 55. When we examine single, married, and college-educated women, we restrict our sample to women aged between 18 and 40.

[14] The average annual wage is won-based.

To further examine the relationship between the prevalence of over working and women's occupational choice across various demographic groups[15], we estimate the following regression:

$$\frac{women\_gr_{ict}}{women\_gr_{ct}} = \alpha + \beta_1 Over\_work_{ict} + \beta_2 \frac{Others_{ict}}{Others_{ct}} + Control_{ict} + Cell_i + Country_C + Year_t + \varepsilon_{ict} \quad (2)$$

where $Over\_work_{ict}$ refers to the share of men aged between 18 and 55 who work more than 50 hours per week in each industry-occupation cell *i* in country *c* in year *t*. β_1 in equation (1) not only captures the impact of long working hours, but also captures the impact of the availability of part-time jobs. In equation (2), β_1 specifically captures the impact of the culture of overworking in Japan and Korea.

Finally, we employ a gradual introduction of the five-day workweek system (40-hour workweek system) as a natural experiment to examine the impact of the legal reduction in working hours on women's occupational choice. We employ previous specifications as follows:

$$\frac{women\_gr_{ict}}{women\_gr_{ct}} = \alpha + \beta_1 40hour\_system_{ict} + \beta_2 \frac{Others_{ict}}{Others_{ct}} + Control_{ict} + Cell_i + Country_C + Year_t + \varepsilon_{ict} \quad (3)$$

[15] As mentioned before, this does not mean the share of women in each cell. This means that the women's industry-occupational distribution (Cortes and Pan 2016) . This means that the dependent variable is share of women in each cell out of all women in the case of the occupational choice of all women.

$40hour\_\text{system}_{ict}$ is measured as the share of workers who work under a 40-hour workweek system in the industry-occupation cell *i* in year *t*. The 40-hour workweek system was mandated depending on firm size; however, the survey does not provide proper information on the respective firm size of each female worker[16]. The share of workers who work under a 40-hour workweek system is a proxy for the mandatory adoption of working-hour reduction.

4.4 Estimation Results

In this section, we present our estimation results. Because our independent variables are the women's industry-occupational distribution, which means the share of women in each cell out of all women, the coefficient looks very small. So we calculate and report the size of these coefficients based on mean. For the estimation, we not only present estimation results using all samples, but also demonstrate estimation results on Japan and Korea, separately. We are interested in both the general trends in the two countries and the differential impact of the flexibility in the working environment on women's occupational choice for each country.

<Table 4.1 to be Inserted Here>

In Table 1, we present estimates that examine the impact of men's average working hours on women's occupational choice. Regression (1) of Table 1 shows that a 10-hour increase in men's average weekly working hours would statistically

[16] The survey provides categorical information on firm size that cannot be matched with the respective firm size of workers under mandatory adoption of the 40-hour workweek system.

significantly decrease women's choice on the specific industry-occupation cell by 13.5% point (calculated based on mean) in the pooled sample of Japanese and Korean women. Regression (2) further shows that our estimation is robust to controlling the distribution of men, which captures demand shock in each industry-occupation.

In regressions (3) to (6), we separately examine the impact of average weekly working hours on the occupational choice of Korean and Japanese women. Regressions (4) and (6) show that a 10-hour increase in weekly working hours is associated with a 13.5% point reduction in Korean women's share in the specific cell, while the same increase in weekly working hours is associated with an 15.1% point reduction in Japanese women's share in the specific industry-occupation cell, after controlling for men's share. The magnitudes of the two estimates are very close to each other.

<Table 4.2 to be Inserted Here>

Table 2 shows the impact of the share of overworked men on women's occupational choice. Regression (2) of Table 2 shows that when the share of overworked men increase from zero to one, the women's share in the specific industry-occupation group declines by 1.35 times in Korea and 1.77 times in Japan. The results imply that overwork discourages women from choosing to join such an occupation.

<Table 4.3 to be Inserted Here>

In Table 3, we focus on college-educated women's occupational choice, as time constraints could be more binding for educated women. Guryan, Hurst, and Kearney (2008) showed that college-educated women tend to spend more time with their children than before, even though they are more likely to be in the labor force. To examine this issue in detail, we separately examine the occupational choice of college-educated women, considering their marital status as well.

Table 3 shows that a 10-hour increase in weekly working hours is associated with a 13.2% point decrease in the share of single women and 12.6% point decrease in the share of married women in a specific occupation in Korea. Regressions (3) and (4) of Table 3 also show similar estimates among college-educated Japanese women. A 10-hour increase in weekly working hours is related to a 12.3% point and a 10.9% point decline in the share of women in a specific occupation among single women and married women, respectively.

Panel B in Table 3 further shows the impact of the share of overworked men on the share of women employed in the specific industry-occupation cell for both countries, considering their marital status. When all men overwork, this decreases women's share in a specific occupation by 1.13 times among single women and 0.92 times among married women in Korea. The share of overworked men has the same negative impact on women's share in a specific occupation in Japan. When all men overwork, this is related to a reduction (for each specific occupation) of 1.62 times among single women and 1.46 times among married women in Japan. Table 3 shows that the impact of prevalent overwork on women does not vary across women's level of education in these two countries.

To further examine the impact of long working hours on women's occupational choice, we focus on married women with children. For the analyses, we use the Japanese labor force survey as the Korean labor force survey does not provide information regarding women who have children.

<Table 4.4 to be Inserted Here>

We estimate equations (1) and (2) in Table 4 using several subsamples of women: those without children, with children, and with children under three. In regressions (1) to (5), we present the impact of an increase in weekly working hours, and the impact of the share of overworked men is presented in regressions (6) to (10). Regressions (1) to (5) demonstrate that the impact of long working hours does not vary in its direction and magnitude across women with and without children. Regressions (6) to (10) also show that the impact of the share of overworked men is not so different across women with and without children. All estimates consistently show that long working hours (overwork) discourage women from staying in a specific industry-occupation cell in Japan.

We interpret that these results show prevalence of the culture of overworking in Japan. Single or married women without children can easily anticipate work-life conflicts when they chose a job with long working hours. Therefore, they refrain from choosing such an occupation, even before they get married and have children.

<Table 4.5 to be Inserted Here>

In Table 5, we restrict our sample to college-educated women in Japan and examine the impact of long working hours by the subgroups of women with and without child. We can see that both the impact of long working hours and the prevalence of overwork negatively affect women's share in a specific occupation for both women with and without child with similar magnitudes.

<Table 4.6 to be Inserted Here>

Finally, we examine the impact of a 40-hour workweek system adopted in Korea on women's occupational choice using the share of workers under a 40-hour workweek system for each industry-occupation cell as a proxy variable for the 40-hour workweek system. In Table 6, we present the estimation of equation (3), considering women's marital status and education level. The results show that the impact of a mandatory reduction in working hours is not significant on single women and college-educated women as a whole. However, regression (3) shows that having a 40-hour workweek system in the whole industry increases women's share in a specific occupation by 55.2% point (calculated based on mean). The results imply that a 40-hour workweek system encourages married women's employment as they are faced with tighter time constraints in Korea.

4.5 Conclusion

In Japan and Korea, two countries with a notorious reputation for working long hours, we found that women choose occupations with shorter working hours and

low likelihood of overwork, regardless of their marital status, education level, and demographic characteristics. We also found that a mandatory reduction in working hours can encourage women's employment in the respective industry and occupation, especially among those who are married.

Our research has limitations. Most importantly, we did not show why certain jobs or certain industries have a culture of long working hours. Possible reasons for the long working hours are the technology related to production, competition among firms, payment schemes that encourage overwork, and a culture that highly evaluates workers who show a high level of loyalty by working long hours. Without identifying the source of the problem, it is meaningless to discuss policies to increase workplace flexibility.

Though limited, our results show the importance of the workplace environment, especially for women with tighter time constraints. Workplace flexibility, such as availability of part-time jobs and low likelihood of overwork, can encourage women to choose and stay longer in a specific occupation. In this study, we show the need for future research that would further examine the source of workplace inflexibility and evaluate the impact of various policies related to workplace flexibility on the actual occupational choice of women.

Chapter 5 Conclusion

Japanese women have been struggling to balance work and personal life for a long time. This struggle arises from both the aspects. In case of the former, the onus lies on the employment practices in Japan, such as long working hours and extra responsibilities to maintain minimum number of employees. Workers need to specialize in working outside to meet the employer's conveniences in exchange for employment stability. In case of personal life, women spend a lot of time on household chores, especially childcare. As a result, they often give up their careers and devote their time to childcare and other household responsibilities.

Under these conditions, the aim of this dissertation was to explore the work-life conflict by empirically examining the following three points. First, in Chapter 2, I examine the intergenerational linkage in employment between a woman and her mother in Japan to explore why Japanese women tend to quit their jobs after pregnancy and tend to devote to childcare. I also discuss in detail how a woman's perception of gender division of household labor and her employment is affected by being brought up by a working mother. Second, in Chapter 3, we examine the Japanese phenomenon called "first-grade shock." When children start first grade, the mothers suddenly experience time constraints because of the reduction of child care support from the government and increased demands of parenting. Under this condition, how women deal with work-life conflict is explored. Finally, in chapter 4, the impact of working environments where long working hours are the norm on women's occupational choices is examined to compare the situation in Korea and Japan.

5.1 Main Findings and Policy Implications

Chapter 2 explores if women still follow their mother's profession when they decide to work.

The results are as follows. First, a woman brought up by a working mother is less likely to be in favor of gender division of household labor. Second, women whose mothers worked during their childhood are more likely to (re)join the labor force market within one to three years after giving birth to their first child. Finally, in the long run, if a woman has a working mother at the age of three, she is more likely to continue to work after graduation from school.

Chapter 3 explores women's work-life conflict their child starts first grade in school. It examines the behavior of women when the government's support for child-rearing decreases and childcare responsibilities expected by the school increases (first-grade shock).

The results show that the number of female part-time workers increases when their children are in first grade but falls to the previous level the next year. The results also show consistent evidence of work-life conflicts, an imbalance in the sharing of housework, emotional distress, as well as evidence regarding the mothers' concern about the life of her children.

Chapter 4 explores the prevalence of long working hours and how the working environment affects a woman's occupational choices.

The empirical evidence suggests that, in general, the prevalence of long working hours and overwork affects women's occupation choices regardless of their marital status, level of education, and existence of child. The evidence also shows that

the adoption of 40-hour workweek system in Korea is positively associated with the share of married women in that industry-occupation.

All the topics are empirically examined to try to explore the work-life conflict. Finally, based on findings of the analysis, some policy implications are made to attenuate the conflict.

Chapter 2 suggests that there is a high possibility that women are likely to follow their mother's employment choice because of a lack of understanding of the support that is available. In order to make use of childcare support systems in line with current lifestyles, it is suggested that women get proper guidance through a workshop by other working women of relatively close age who already use the provided facilities. This would also help the women understand the kind of time constraints they would face. Such information should be provided to women before pregnancy or childbirth so that they can take it into consideration while making professional choices.

Chapter 3 calls for immediate policies to attenuate the first-grade shock and prevent an interruption in the mother's career. After-school childcare programs can help with the tight time constraints mothers face and support their work-life balance. First time mothers would experience less concern if they received proper mentoring or guidance regarding their child's first year. Finally, it is important that the child-rearing responsibilities and housework chores are equally distributed within the family.

Chapter 4 suggests through comparison between Korea and Japan that in order to promote the employment of women, it is necessary to reduce long working hours and promote flexibility. The 40-hour workweek system followed in Korea is attractive for Japanese women. There is a need to carefully examine how the Revised Labor Standard Act enforced from April 2019 affects the work-life conflict faced by women.

5.2 Possible Extension of Research

Here, I point out the limitations of the analysis in each chapter and suggest further research.

In Chapter 2, I analyze intergenerational linkage using unique data. However, the analysis makes use of pooled data; the questions about mothers' working style are reported by women (daughter) in retrospect. Ideally this should be analyzed using long panel data. In addition, this survey does not include data for father's annual income or occupation when the respondent was a child. So I include father's education as an additional explanatory variable. This is done to address the dependence of family background on the father's income and occupation. Ideally this should be analyzed using the father's income and occupation. Furthermore, this chapter analyzes the effects of working mothers on their daughters; however, to make policy implications as mentioned in the previous section, it is necessary to analyze whether the mother or the female colleagues have more of an impact on working women.

In Chapter 3, consistent results are obtained on maternal work-life conflict in the face of the first-grade shock, but the analysis is based on data with a rather small sample size. Therefore, it is difficult to analyze in detail the difference between the effect of a housewife coming back to work and the effect of a working woman quitting her job when her children are in first grade. It is important to examine this by using data of a larger sample. Since such an analysis of housewives is not found in previous studies, it needs to be examined using a larger sample size. In addition, we need to find how to increases husband's supports. Furthermore, we assume the reason why mothers

(re)join labor market when the youngest child becomes the first grade because of the age of mothers, however we do not empirically prove that. So we need to empirically analyze the reason why mothers come back to work when the youngest child becomes the first grade even though mothers suffer severe work-life conflict.

In Chapter 4, we analyzed the workplace environment using data provided by the government, so we are likely to grasp the overall trend fairly accurately. However we do not show the impact of working hours of men between 18-40 and men between 41-55 to check robustness or heterogeneity. Also, we do not show why certain jobs or certain industries have long-working hour culture. The source of long-working hour could be its technology related to production, competition among firms, payment scheme encouraging over-work, or culture which highly evaluate workers who show high level of loyalty through long-working hour. Without identifying the source of problem, it would be meaningless to discuss policies to increase workplace flexibility.

The limitations pointed out above remain for the future research.

Appendix

Appendix 3.1 definitions of variables

Variables	Definition
Working now	Do you work for an income now? 1 if answering "working"
Part-timer	What is your working status? 1 if answering "contract employee", "dispatched temporary", "part-timer", "day hire"
Working schedule	Do you work regularly? 1 if answering "regularly", "mostly regularly"
Not working (working hours do not match)	Why are you currently not working? 1 if answering "no job satisfying conditions of working hours"
Concern(characteristics and habits)	Do you have any concerns about raising children? (characteristics and habits) 1 if answering "yes"
Concern (study)	Do you have any concerns about raising children (study) 1 if answering "yes"
Concern (bullying)	Do you have any concerns about raising children (bullying) 1 if answering "yes"
Strict discipline	Do you think that the discipline against children at home is tough overall? 1 if answering "Very tough", "Somewhat tough"
WLC (too tired to do housework)	How often have you been "too tired to do housework" 1 if answering "Almost every day", "sometimes during the week", "sometimes during the month"
WLC (working too long to do housework and child care)	How often have you been "working too long to do housework and childcare" 1 if answering "Almost every day", "sometimes during the week", "sometimes during the month"
depression	CES-D (Center for Epidemiologic Studies Depression Scale) index 1 if depressed
Housework ratio of husband	How much does your husband share housework, including childcare; please write from 0, if doing nothing, to 10, if doing it all. Normalized with mean 0 and standard deviation 1
Mother's age	Mother's age
Years of mothers' education	What is your education level? 9 if answering "junior high school", 12 if answering "high school", 14 if answering "2-year college", and 16 if answering "4-year university or higher"
Wage of husband	Write down your husband's income. Use real numbers added and put 0 if answering "single mother"
Living together or closer to parents(in-law)	Do you live with your parents(in-law)? 1 if answering "living with", "living on the same premises", "living within walking distance"
Childcare Support from parents(in-law)	How often do you receive housekeeping and parenting support from your parents(in-law)? 1 if answering "More than twice a month" and "About once a month"
Financial support from parents(in-law)	How often do you receive financial support from your parents(in-law)? 1 if answering "More than twice a month" and "About once a month"
Treatment	1 if the child of the respondent entered elementary school in 2014
Grade cohorts	Birth year
Year of survey	Year of survey

Appendix 4.1 Industry-Occupation classification used in our analyses

Industry	Occupation
Agriculture, forestry, and fishery	Manager
Mining	Professionals and Technicians
Manufacturing	General White-collar
Electricity, Gas, and Water	Sales Workers
Construction	Service Workers
Wholesale and Retail	Agriculture ,Forestry and Fishery Workers
Accommodation and Restaurants	Manufacture Workers
Transportation	Transportation Workers and Drivers
Telecommunication	Construction Workers
Finance	Unskilled Workers
Real estate and Lease	
Business Service	
Public & International Institute	
Education	
Health	
Entertainment and Sports	
Others including Individual Service and Recycling	
Domestic Work	

Appendix 4.2 Women's Distribution of Industry-Occupation Cell

	Obs	Mean	Std. Dev.	Min	Max
			Korea		
Share of women age 18 to 40 working in industry-occupation i	1,616	0.0093	0.0210	0	0.1497
Share of college educated single women age 18 to 55 working in industry-occupation i	1,616	0.0093	0.0255	0	0.2698
Share of college educated married women age 18 to 55 working in industry-occupation i	1,616	0.0093	0.0284	0	0.3331
			Japan		
Share of women age 18 to 40 working in industry-occupation i	2,012	0.0074	0.0186	0	0.1357
Share of college educated single women age 18 to 55 working in industry-occupation i	2,012	0.0074	0.0198	0	0.1772
Share of college educated married women age 18 to 55 working in industry-occupation i	2,012	0.0074	0.0213	0	0.2663
Share of married women age 18 to 40 without children working in industry-occupation i	2,012	0.0074	0.0182	0	0.1277
Share of married women age 18 to 40 with children working in industry-occupation i	2,012	0.0074	0.0192	0	0.1544
Share of married women age 18 to 40 with children under 3 working in industry-occupation i	2,012	0.0074	0.0203	0	0.2003
Share of college educated married women age to 55 without children working in industry-occupation i	2,012	0.0074	0.0198	0	0.1857
Share of college educated married women age to 55 with children under 3 working in industry-occupation i	2,012	0.0074	0.0231	0	0.2988

Because our independent variables are the industry-occupational distribution of women in the women's demographic group of interest; for example, whole women, single women, college educated women (Cortes and Pan 2016). The coefficients are very small because we calculate the share of women in each industry-occupational cell out of all women. The mean of the share becomes smaller when the number of industry-occupation cell used for analysis is larger. For example in Korea, the number of occupation-industry cell used for analysis is smaller than that of Japan, so the mean share is larger compared to that in Japan.

The standard error of married women with children under three is larger than that of single women. Also, the standard error of college educated women is larger than the whole women. This means that college educated women and married women with children tend to work regardless of the working environment. College educated women may work more like men and married women with children may choose the working environment according to the accessibility of childcare support systems.

However, the numbers are very small so it is difficult to see the difference.

Appendix 4.3 Share of Men Working in Each Industry-Occupation Cell

Industry	Korea	Japan
Agriculture, forestry, and fishery	0.583	0.650
Mining	0.985	0.802
Manufacturing	0.683	0.689
Electricity, Gas, and Water	0.831	0.866
Construction	0.905	0.840
Wholesale and Retail	0.509	0.491
Accommodation and Restaurants	0.288	0.401
Transportation	0.861	0.809
Telecommunication	0.707	0.705
Finance	0.462	0.465
Real estate and Lease	0.558	0.606
Business Service	0.607	0.574
Public & International Institute	0.689	0.753
Education	0.321	0.480
Health	0.178	0.224
Entertainment and Sports	0.565	0.521
Others including Individual Service and Recycling	0.609	0.542
Domestic Work	0.000	0.340

Appendix 4.4 Expansion of 40-hour Workweek Implementation in Korea

Industry or Firm size	Date of Implementation
Finance sector	2002 July (voluntary adoption)
Firm size>1000 workers	2004 July
Firm size 300-999	2005 July
Firm size 100-299	2006 July
Firm size 50-99	2007 July
Firm size 20-49	2008 July
Firm size 5-19	2011 July

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Tables

Table 2.1 Wage with respect to Employment Types: Average and Median (Yen)

	Obs.	Ave.	Median
Full Time Employment Now	693	1,554.25	1,282.05
Part Time Employment Now	1,365	853.42	747.86
Others	248	1,121.69	657.05
Not Working Now	1,048	.	.
Continuing to working for Full Time at the Same Company after Graduation	293	2,058.78	1,923.08
Total	2,599	1,201.78	927.20

Source: the National Survey of Households with Children (NSHC) in 2014 by the Japan Institute for Labour Policy and Training (JILPT)

Table 2.2 the Ratio of “No experience to use the systems and do not intend to use in the future”

Childcare support policy	Observations	Do not know the system	Not intend to use the systems	ratio
Childcare Leave	1,995	214	1,184	66.5%
Nursing Leave	1,971	739	775	62.9%
Short Working Hour	1,971	630	889	66.3%
After School Care Program	2,029	111	847	44.2%
Maternity Helper (Local Government Base)	1,965	769	1,059	88.5%
“Mothers' Hello Work"	1,982	837	757	66.1%

Source: the National Survey of Households with Children (NSHC) in 2014 by the Japan Institute for Labour Policy and Training (JILPT)

Table 2.3 Mother's Working Decision and a Woman's Perception of Gender Division of Household Labor

	Gender Division of Household Labor: "Favor"					
	Panel A: When A woman was three					
	(1)	(2)	(3)	(4)	(5)	(6)
Her mother was working						
	-0.0429**	-0.0458**	-0.0397*	-0.0395*	-0.0375*	-0.0365*
	(0.0201)	(0.0201)	(0.0215)	(0.0215)	(0.0218)	(0.0219)
Controls		X	X	X	X	X
Education			X	X	X	X
Husband's wage				X		X
Own wage					X	X
	2,740	2,718	2,401	2,381	2,303	2,284
	Panel B: A woman was six					
	(1)	(2)	(3)	(4)	(5)	(6)
Her mother was working						
	-0.0553***	-0.0579***	-0.0417**	-0.0420**	-0.0363*	-0.0361*
	(0.0192)	(0.0192)	(0.0206)	(0.0206)	(0.0208)	(0.0209)
Controls		X	X	X	X	X
Education			X	X	X	X
Husband's wage				X		X
Own wage					X	X
	2,861	2,838	2,504	2,483	2,396	2,376
	Panel C: A woman was twelve					
	(1)	(2)	(3)	(4)	(5)	(6)
Her mother was working						
	-0.0452**	-0.0515**	-0.0424*	-0.0442**	-0.0365	-0.0390*
	(0.0208)	(0.0208)	(0.0224)	(0.0223)	(0.0228)	(0.0227)
Controls		X	X	X	X	X
Education			X	X	X	X
Husband's wage				X		X
Own wage					X	X
	2,912	2,889	2,549	2,528	2,442	2,422

Notes:
The data is from the National Survey of Households with Children (NSHC) in 2014 by the Japan Institute for Labour Policy and Training (JILPT)
Set of control variables are: age, regular employment right after graduating from school, employed by large firm immediately after graduation, employed as bureaucrat right after graduation, employed after equal opportunity law was passed and delivery of first child after childcare leave was made compulsory, marital status, number of children, age of youngest child, co-residence (or approximate) with parents, husband's educational attainment, own house and having housing loan, educational attainment of father, number of siblings, if a woman is the first child or not, and experience of being abused

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 2.4 Mother's Employment Type and Woman's Perception of Gender Division of Household Labor:

	Gender Division of Household Labor: "Favor"								
	Panel A: A woman was three			Panel B: A woman was six			Panel C: A woman was twelve		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Mother's employment type (Base:not working)									
part-time	-0.0529*	-0.00949	-0.0121	-0.0550**	-0.0231	-0.0233	-0.0518**	-0.0424	-0.0428
	(0.0274)	(0.0315)	(0.0314)	(0.0236)	(0.0259)	(0.0258)	(0.0244)	(0.0264)	(0.0262)
full-time	-0.0414*	-0.0543**	-0.0484*	-0.0609***	-0.0566**	-0.0466*	-0.0536**	-0.0442*	-0.0370
	(0.0229)	(0.0240)	(0.0248)	(0.0224)	(0.0238)	(0.0245)	(0.0242)	(0.0257)	(0.0263)
Controls	X	X	X	X	X	X	X	X	X
Education		X	X		X	X		X	X
Husband's wage			X			X			X
Own wage			X			X			X
Observations	2,718	2,401	2,284	2,838	2,504	2,376	2,889	2,549	2,422

Notes: See table 2.3

Table 2.5 Mother's Timing of Join Labor market and a Woman's Perception of Gender Division of Household Labor

	Gender Division of Household Labor: "Favor"			
	(1)	(2)	(3)	(4)
Timing of mother's starting or "coming back" to work when				
A woman was three	-0.0598**	-0.0438*	-0.0443*	-0.0384
	(0.0238)	(0.0256)	(0.0256)	(0.0262)
A woman was six	-0.0628**	-0.0369	-0.0406	-0.0319
	(0.0289)	(0.0307)	(0.0305)	(0.0307)
A woman was twelve	-0.0139	-0.0111	-0.0134	-0.0125
	(0.0259)	(0.0282)	(0.0279)	(0.0279)
Controls	X	X	X	X
Education		X	X	X
Husband's wage			X	X
Own wage				X
Observations	2,994	2,634	2,612	2,498

Notes: See Table 2.3

Mother's timing of labor market participation in this case is that Women's mother was "not working before" and came back when women' were three years old, six years old and twelve years old. In Japan, most of the women work outside after graduation then quit their jobs after marriage or pregnancy. So it could be said "come back to work".

See section 4 for detail.

Table 2.6 Mother's Working Decision and Woman's Working Decision after First Childbirth

	Working 1 Year after First Childbirth			Working 3 Year after First Childbirth		
Women's age	Three	Six	Twelve	Three	Six	Twelve
	(1)	(2)	(3)	(4)	(5)	(6)
Her mother was working						
	0.168***	0.155***	0.114***	0.154***	0.134***	0.0963***
	(0.0200)	(0.0199)	(0.0233)	(0.0193)	(0.0197)	(0.0231)
Observations	2,709	2,826	2,877	2,709	2,826	2,877

Notes:

Data is from the National Survey of Households with Children (NSHC) in 2014 by the Japan Institute for Labour Policy and Training (JILPT)

Set of control variables are: age at that time, educational attainment, regular employment right after graduating from school, employed by large firm immediately after graduation, employed as bureaucrat right after graduation, employed after equal opportunity law was passed and delivery of first child after childcare leave was made compulsory, marital status at that time, husband's educational attainment, educational attainment of father, number of siblings, if a woman is the first child or not, and experience of being abused

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 2.7 Mother's Employment type and Woman's Working Decision after First Childbirth

Women's age:	Working 1 Year after First Childbirth			Working 3 Year after First Childbirth		
	Three	Six	Twelve	Three	Six	Twelve
	(1)	(2)	(3)	(4)	(5)	(6)
Mother's employment type						
Base: not working						
part-time	0.184***	0.134***	0.0687***	0.150***	0.106***	0.0480*
	(0.0319)	(0.0264)	(0.0264)	(0.0316)	(0.0256)	(0.0249)
full-time	0.166***	0.173***	0.154***	0.164***	0.156***	0.136***
	(0.0244)	(0.0239)	(0.0255)	(0.0241)	(0.0233)	(0.0245)
Observations	2,709	2,826	2,877	2,709	2,826	2,877

Notes: See Table 2.6

Table 2.8 Mother's Timing of Coming Back to Work and a Woman's Working after First Childbirth

	Working 1 Year after First Childbirth		
	(1)	(2)	(3)
Timing of mother's starting or "coming back" to work when:			
A woman was three	0.168***	0.182***	0.188***
	(0.0235)	(0.0248)	(0.0247)
A woman was six	0.0541*	0.0691**	0.0761**
	(0.0295)	(0.0312)	(0.0312)
A woman was twelve	0.0160	0.0128	0.0190
	(0.0283)	(0.0295)	(0.0294)
Controls		X	X
Education			X
Observations	3,327	3,003	2,980
	Working 3 Year after First Childbirth		
	(4)	(5)	(6)
Timing of mother's starting or "coming back" to work when:			
A woman was three	0.148***	0.157***	0.161***
	(0.0228)	(0.0242)	(0.0241)
A woman was six	0.0178	0.0327	0.0390
	(0.0288)	(0.0306)	(0.0306)
A woman was twelve	0.00682	0.00552	0.00982
	(0.0281)	(0.0294)	(0.0293)
Controls		X	X
Education			X
Observations	3,327	3,003	2,980

Notes:

Data is from the National Survey of Households with Children (NSHC) in 2014 by the Japan Institute for Labour Policy and Training (JILPT)

Set of control variables are: age at that time, regular employment right after graduating from school, employed by large firm immediately after graduation, employed as bureaucrat right after graduation, employed after equal opportunity law was passed and delivery of first child after childcare leave was made compulsory, marital status at that time, husband's educational attainment, educational attainment of father, number of siblings, if a woman is the first child or not, and experience of being abused

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

For the definition of "timing", see section 4 and table 2.5

Table 2.9 Mother's Working Decision and Employment Type and a Woman's Continuing to Work since Graduation from School

Women's age	Continued to Work since Graduation from School		
	Three	Six	Twelve
	(1)	(2)	(3)
Her mother was working			
	0.0620***	0.0314	0.0452*
	(0.0222)	(0.0222)	(0.0243)
Observations	2,228	2,313	2,360
	(4)	(5)	(6)
Mother's employment type (Base:not working)			
part-time	0.0249	-0.00698	0.0168
	(0.0350)	(0.0281)	(0.0272)
full-time	0.0811***	0.0616**	0.0713***
	(0.0251)	(0.0253)	(0.0272)
Observations	2,228	2,313	2,360

Notes:

Data is from the National Survey of Households with Children (NSHC) in 2014 by the Japan Institute for Labour Policy and Training (JILPT)

Set of control variables are: age, educational attainment, regular employment right after graduating from school, employed by large firm immediately after graduation, employed as bureaucrat right after graduation, employed after equal opportunity law was passed and delivery of first child after childcare leave was made compulsory, marital status, husband's educational attainment, educational attainment of father, number of siblings, if a woman is the first child or not, and experience of being abused

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 2.10 Mother's Timing of Coming Back to Work and Continuing to Work since Graduation from School

	Continued to Work after Graduation from School	
	(1)	(2)
Timing of mother's starting or "coming back" to work when:		
A woman was three	0.0848***	0.0865***
	(0.0268)	(0.0269)
A woman was six	0.0324	0.0292
	(0.0328)	(0.0328)
A woman was twelve	0.0529*	0.0497
	(0.0305)	(0.0305)
Observations	2,452	2,432

Notes: See Table 2.9

Table 3.1 Descriptive Statistics

Mothers	with preschool child		with elementary school child	
Variable	Mean	Std. Dev.	Mean	Std. Dev.
Labor Market Participation	0.649	0.477	0.765	0.424
Working part-time*	0.317	0.466	0.417	0.493
Working in an irregular schedule*	0.146	0.354	0.147	0.354
Strict discipline	0.466	0.499	0.519	0.500
Concern (characteristics and habits)	0.439	0.496	0.442	0.497
Concern (study)	0.226	0.419	0.457	0.498
Concern (bullying)	0.067	0.251	0.097	0.296
WLC (too tired to do housework)	0.457	0.498	0.553	0.497
WLC (working too long to do housework and child care)	0.346	0.476	0.403	0.491
Depression (CES-D scale)	0.077	0.267	0.101	0.301
Shared housework by husband	0.289	1.006	0.008	0.976
Mother's age	35.2	5.652	39.5	5.396
Sex of the first child	0.477	0.500	0.489	0.500
Sex of the youngest child	0.467	0.499	0.500	0.500
Years of mother's education	13.096	1.919	12.929	1.791
Wage of husband (yen)[17]	344,2810	295,0290	322,0730	358,4030
Living together or closer to parents(in-law)	0.459	0.498	0.486	0.500
Childcare support from parents(in-law)	0.539	0.499	0.438	0.496
Financial support from parents(in-law)	0.197	0.398	0.176	0.381
N	1,378		1,782	

Note: These statistics are calculated out of all mothers, including mothers not in the labor force.

[17] Husband's wage of single household is put 0 yen. 401 samples are missing.

Table 3.2 First-grade Shock and a Mother's Labor Market Participation

Child	A. Labor Market Participation					
	First child			Youngest child		
	1	2	3	4	5	6
First-grade shock	0.155**	0.105	0.100	0.359***	0.276***	0.301***
	(0.0721)	(0.0796)	(0.0816)	(0.0505)	(0.0556)	(0.0550)
Wage of husband (1 million yen)		-0.035***	-0.034***		-0.029***	-0.028***
		(0.0054)	(0.0057)		(0.0041)	(0.0043)
Living with or close to parents			0.0857***			0.0818***
			(0.0293)			(0.0244)
Childcare support from parents			0.0826***			0.102***
			(0.0291)			(0.0238)
Financial aid from parents			-0.143***			-0.140***
			(0.0350)			(0.0299)
N	1,900	1,555	1,471	2,489	2,043	1,938
R-squared	0.125	0.200	0.226	0.128	0.184	0.212

Child	B. Type of Work					
	Working part-time			Working in an irregular schedule		
	Youngest child			Youngest child		
	1	2	3	4	5	6
First-grade shock	0.295***	0.274***	0.244***	0.0260	0.0233	0.0407
	(0.0551)	(0.0632)	(0.0656)	(0.0560)	(0.0549)	(0.0573)
Wage of husband (1milliom yen)		-0.0036	-0.0032		-0.0044	-0.0043
		(0.0035)	(0.0037)		(0.0037)	(0.0039)
Living with or close to parents			-0.0384			0.0348
			(0.0258)			(0.0237)
Childcare support from parents			-0.0374			-0.00300
			(0.0241)			(0.0238)
Financial aid from parents			-0.0118			0.0392
			(0.0294)			(0.0330)
N	2,486	2,041	1,936	1,827	1,519	1,433
R-squared	0.127	0.159	0.167	0.114	0.135	0.136

Note: Standard errors are in parentheses and clustered within the 175-census block. The set of control variables includes year of survey, child's cohort fixed effects, gender of child, mother's age and years of education. The sample is restricted to all mothers with children below grade 6.
* $p < .1$, ** $p < .05$, *** $p < .01$.

Table 3.3 Extended Analyses of First-grade Shock on a Mother's Labor Market Participation

	A. Labor Market Participation					
Child	First child			Youngest child		
	1	2	3	4	5	6
2 years before 1st grade	0.0468	-0.0305	-0.0627	0.123**	0.0551	0.0633
	(0.0816)	(0.0931)	(0.0924)	(0.0511)	(0.0568)	(0.0583)
1 year before 1st grade	0.0558	0.0265	0.0242	0.182***	0.146***	0.168***
	(0.0773)	(0.0869)	(0.0854)	(0.0475)	(0.0534)	(0.0546)
1st grade	0.0839	0.0219	-0.0117	0.235***	0.173***	0.183***
	(0.0728)	(0.0842)	(0.0869)	(0.0547)	(0.0596)	(0.0584)
2nd grade	-0.0389	-0.0246	-0.0100	-0.00694	0.0121	0.0311
	(0.0586)	(0.0604)	(0.0655)	(0.0434)	(0.0484)	(0.0475)
3rd grade	0.0650	0.0727	0.0747	0.0449	0.0355	0.0246
	(0.0524)	(0.0552)	(0.0574)	(0.0449)	(0.0483)	(0.0494)
4th grade	-0.00663	-0.00362	0.00895	-0.0273	-0.0308	-0.0256
	(0.0467)	(0.0513)	(0.0530)	(0.0477)	(0.0485)	(0.0501)
5th grade	0.0374	0.00891	0.0148	0.0383	0.0459	0.0549
	(0.0447)	(0.0499)	(0.0523)	(0.0429)	(0.0423)	(0.0443)
6th grade	0.0141	0.0292	0.0234	0.0810**	0.0505	0.0429
	(0.0431)	(0.0471)	(0.0503)	(0.0395)	(0.0410)	(0.0429)
Controls A		Y	Y		Y	Y
Controls B			Y			Y
N	1,900	1,555	1,471	2,514	2,062	1,956
R-squared	0.125	0.200	0.226	0.129	0.183	0.212

Note: All regressions control for year of survey and child's birth cohort. Control A includes gender of child, husband's wage, mother's age and education. Control B includes proximity to parents(in-law), informal childcare support, and financial support from parents(in-law).
* $p < .1$, ** $p < .05$, *** $p < .01$.

Table 3.4 Extended Analyses of First-grade Shock on a Mother's Type of Work

	B. Type of Work					
	Working part-time			Working in an irregular schedule		
Child	Youngest child					
	1	2	3	1	2	3
2 years before 1st grade	0.119**	0.0704	0.0674	0.0266	0.0493	0.0704
	(0.0486)	(0.0539)	(0.0565)	(0.0548)	(0.0549)	(0.0586)
1 year before 1st grade	0.182***	0.170***	0.167***	-0.0364	-0.0313	-0.0273
	(0.0492)	(0.0546)	(0.0560)	(0.0545)	(0.0528)	(0.0539)
1st grade	0.247***	0.203***	0.187***	-0.00825	0.0222	0.0289
	(0.0557)	(0.0627)	(0.0642)	(0.0549)	(0.0550)	(0.0555)
2nd grade	0.0349	0.0750	0.0889	-0.0232	-0.0411	-0.0277
	(0.0504)	(0.0577)	(0.0599)	(0.0373)	(0.0430)	(0.0435)
3rd grade	-0.0367	-0.0623	-0.0711	0.0301	0.0538	0.0310
	(0.0527)	(0.0594)	(0.0598)	(0.0413)	(0.0464)	(0.0454)
4th grade	0.00834	0.0217	0.00856	-0.000752	-0.0353	-0.0263
	(0.0611)	(0.0705)	(0.0720)	(0.0458)	(0.0507)	(0.0487)
5th grade	0.0268	0.0192	0.0250	0.0139	0.0252	0.0294
	(0.0588)	(0.0647)	(0.0676)	(0.0483)	(0.0523)	(0.0533)
6th grade	0.0144	0.0169	0.00579	0.0143	-0.00136	0.00533
	(0.0481)	(0.0567)	(0.0595)	(0.0437)	(0.0491)	(0.0513)
Controls A		Y	Y		Y	Y
Controls B			Y			Y
N	2,486	2,041	1,936	1,827	1,519	1,433
R-squared	0.127	0.159	0.167	0.114	0.135	0.136

Note: All regressions control for year of survey and child's birth cohort. Control A includes gender of child, husband's wage, mother's age and education. Control B includes proximity to parents(in-law), informal childcare support, and financial support from parents(in-law).
* $p < .1$, ** $p < .05$, *** $p < .01$.

Table 3.5 Depression, Share of housework by husband and Work-life conflict

Child	Depression		Share of housework by husband		Too tired to do housework		Working too long to do housework	
	Youngest child							
	1	2	3	4	5	6	7	8
First-grade shock	0.118***	0.0764**	-0.633***	-0.409***	0.286***	0.255***	0.197***	0.196***
	(0.0336)	(0.0384)	(0.114)	(0.122)	(0.0563)	(0.0658)	(0.0585)	(0.0630)
Wage of husband (1 million yen)		-0.0091***		0.100***		-0.029***		-0.030***
		(0.0021)		(0.011)		(0.0043)		(0.0037)
Living with or close to parents		-0.0111		-0.0739		0.0110		0.0456*
		(0.0173)		(0.0486)		(0.0242)		(0.0250)
Childcare support from parents		-0.0486***		0.175***		0.115***		0.0876***
		(0.0183)		(0.0540)		(0.0249)		(0.0255)
Financial aid from parents		0.0120		-0.0547		-0.124***		-0.0898**
		(0.0196)		(0.0671)		(0.0346)		(0.0350)
N	2,321	1,965	2,441	1,917	2,542	1,966	2,542	1,966
R-squared	0.086	0.110	0.140	0.254	0.105	0.180	0.084	0.148

Note: See the note for Table 3.2. For dependent variables, we employed seven out of twenty CES-D (Center for Epidemiologic Studies Depression Scale) measures for the scoring of distress level. Then, we used a cut-off score 20, which is higher than the 26 provided by CES-D, to construct a depression indicator. The perception of the share of housework by the husband is normalized.

Table 3.6 Extended Analyses of a Mother's Emotional Distress

	Depression	Share of housework by husband	Too tired to do housework	Working too long to do housework
Child	Youngest Child			
	1	2	3	4
2 years before 1st grade	-0.000987	-0.167	0.0532	0.0545
	(0.0302)	(0.129)	(0.0607)	(0.0509)
1 year before 1st grade	0.0555	-0.181	0.150**	0.0849
	(0.0385)	(0.126)	(0.0644)	(0.0577)
1st grade	0.105***	-0.217*	0.126*	0.153**
	(0.0387)	(0.114)	(0.0671)	(0.0635)
2nd grade	-0.0386	-0.135	0.0408	-0.0382
	(0.0437)	(0.107)	(0.0606)	(0.0576)
3rd grade	-0.00967	0.0264	0.0978*	0.0510
	(0.0417)	(0.127)	(0.0556)	(0.0550)
4th grade	-0.0278	-0.168	-0.145***	-0.0187
	(0.0402)	(0.128)	(0.0527)	(0.0541)
5th grade	0.0194	0.000842	0.0338	-0.0798*
	(0.0402)	(0.109)	(0.0534)	(0.0480)
6th grade	0.0281	0.0836	0.102*	0.128**
	(0.0422)	(0.111)	(0.0571)	(0.0575)
N	1,871	1,917	1,966	1,966
R-squared	0.116	0.254	0.180	0.148

See the note for Table 3. 4

Table 3.7 Extended Analyses of First-grade Shock and a Mother's Concerns and Discipline

	Strict discipline		Characteristics or habits		Study		Being bullied	
Child	F	Y	F	Y	F	Y	F	Y
	1	2	3	4	5	6	7	8
2 years								
before 1st grade	0.0902	0.0827	0.0837	0.0230	-0.0370	0.00746	0.0222	0.0305
	(0.0955)	(0.0612)	(0.0922)	(0.0614)	(0.0605)	(0.0544)	(0.0262)	(0.0338)
1 year								
before 1st grade	0.157*	0.0916	0.152*	0.0127	0.0282	0.0637	0.0570*	0.0421
	(0.0922)	(0.0598)	(0.0878)	(0.0666)	(0.0668)	(0.0536)	(0.0297)	(0.0311)
1st grade	0.212**	0.0842	0.158*	0.0129	0.0951	0.139**	0.0616**	0.0674*
	(0.0938)	(0.0627)	(0.0873)	(0.0626)	(0.0653)	(0.0574)	(0.0292)	(0.0352)
2nd grade	0.0439	0.0316	0.0850	0.108*	0.0609	0.0680	0.0369	-0.0152
	(0.0611)	(0.0615)	(0.0662)	(0.0636)	(0.0611)	(0.0592)	(0.0379)	(0.0381)
3rd grade	-0.0478	-0.0917	-0.0398	-0.145**	0.0655	-0.0296	-0.0259	-0.0178
	(0.0675)	(0.0628)	(0.0664)	(0.0589)	(0.0653)	(0.0571)	(0.0403)	(0.0336)
4th grade	0.0603	0.110*	-0.0650	0.0324	0.0950	-0.0106	0.0128	0.0238
	(0.0707)	(0.0611)	(0.0623)	(0.0578)	(0.0669)	(0.0576)	(0.0409)	(0.0339)
5th grade	-0.0264	0.00806	0.0354	-0.0229	-0.00805	-0.0233	0.00349	-0.00943
	(0.0662)	(0.0614)	(0.0603)	(0.0567)	(0.0587)	(0.0599)	(0.0412)	(0.0362)
6th grade	0.00699	-0.108*	-0.0705	-0.00939	0.101*	0.105*	-0.00246	-0.0198
	(0.0677)	(0.0605)	(0.0548)	(0.0549)	(0.0596)	(0.0622)	(0.0385)	(0.0332)
Observations	1,485	1,952	1,496	1,966	1,496	1,966	1,496	1,966
R-squared	0.146	0.095	0.148	0.100	0.236	0.170	0.146	0.108

Note: See the note for Table 3.4.
Child "F" indicates first-grade shock in the case of a first child, and "Y" indicates first-grade shock in the case of the youngest child.

Table 4.1 Mean Working Hours of Men per Week and Share of Whole Women in Japan and Korea

	Share of women age 18 to 40 working in industry-occupation i					
	Whole		Korea		Japan	
	(1)	(2)	(3)	(4)	(5)	(6)
Mean working hours per week (divided by 10) of men age 18 to 55 working in industry-occupation i (calculated based on mean dependent variables)	-0.135***	-0.145***	-0.074**	-0.135***	-0.173**	-0.151***
	(0.00135)	(0.0106)	(0.0123)	(0.0087)	(0.0025)	(0.0019)
Share of individual of the different group working in industry-occupation i:						
Men		***		***		***
Observations	3,628	3,628	1,616	1,616	2,012	2,012
R-squared	0.211	0.520	0.199	0.538	0.253	0.543

Notes: The data is from 2002 to 2016 Labor Force Survey in Korea and Japan. The unit of observation is an industry-occupation cell by year.
The set of control variables include mean annual wage (won base), mean firm size, industry fixed effect, occupation fixed effect, year fixed effect and country fixed effect. Means and the shares are calculated by using provided sampling weights.
Standard errors are in parentheses and clustered within the industry.
*** p<0.01, ** p<0.05, * p<0.1

Table 4.2 Share of Men aged 18 to 55 Working 50 Hours or More per Week and Share of Whole Women Age 18 to 40 Working in Industry-Occupation in Korea and Japan

	Share of women age 18 to 40 working in industry-occupation i					
	Whole		Korea		Japan	
	(1)	(2)	(3)	(4)	(5)	(6)
Share of men aged 18 to 55 working 50+ hours (calculated based on mean dependent variables)						
	-1.156***	-1.525***	-0.611*	-1.356***	-1.743**	-1.770***
	(0.141)	(0.120)	(0.15)	(0.113)	(0.297)	(0.23)
Share of individual of the different group working in industry-occupation i:						
Men		***		***		***
Observations	3,628	3,628	1,616	1,616	2,012	2,012
R-squared	0.205	0.518	0.197	0.536	0.248	0.543

Note: see table 4.1

Table 4.3 Both Mean Working Hours and Share of Men Aged 18 to 55 Working 50 Hours or More per Week and Share of College Educated Women Age 18 to 40 Working in Industry-Occupation in Korea and Japan

	Share of college educated women age 18 to 55 working in industry-occupation i			
	Panel A			
	Korea		Japan	
	Single	Married	Single	Married
	(1)	(2)	(3)	(4)
Mean working hours (divided by 10) per day of men age 18 to 55 working in industry-occupation i (calculated based on mean dependent variables)				
	-0.132***	-0.126**	-0.123***	-0.109***
	(0.013)	(0.016)	(0.010)	(0.009)
Share of individual of the different group working in industry-occupation i:				
College educated men	***	**	***	***
Observations	1,616	1,616	2,012	2,012
R-squared	0.575	0.515	0.705	0.657
	Panel B			
	Korea		Japan	
	Single	Married	Single	Married
	(5)	(6)	(7)	(8)
Share of men aged 18 to 55 working 50+ hours (calculated based on mean dependent variables)				
	-1.130***	-0.924**	-1.622***	-1.459***
	(0.116)	(0.123)	(0.138)	(0.126)
Share of individual of the different group working in industry-occupation i:				
College educated men	***	**	***	***
Observations	1,616	1,616	2,012	2,012
R-squared	0.571	0.511	0.707	0.659

Notes: The data is from 2002 to 2016 Labor Force Survey in Korea and Japan. The unit of observation is an industry-occupation cell by year.
The set of control variables include mean annual wage (won base), mean firm size, industry fixed effect, occupation fixed effect, country fixed effect and year fixed effect.
Means and the shares are calculated by using provided sampling weights.
Standard errors are in parentheses and clustered within the industry.
*** p<0.01, ** p<0.05, * p<0.1

Table 4.4 Mean Working Hour of Men per Week and the Share of Married Working Women with Children under Three and without Children in Japan

	Share of married women age 18 to 40 working in industry-occupation i				
	Without children	With children		With children under 3	
	(1)	(2)	(3)	(4)	(5)
Mean working hours per week (divided by 10) of men age 18 to 55 working in industry-occupation i(calculated based on mean dependent variables)					
	-0.156***	-0.178**	-0.154***	-0.003	-0.151**
	(0.017)	(0.024)	(0.019)	(0.075)	(0.021)
Share of individual of the different group working in the same industry-occupation i:					
Men	***		***		***
Observations	2,012	2,012	2,012	2,012	2,012
R-squared	0.526	0.247	0.541	0.876	0.419
	Without children	With children		With children under 3	
	(6)	(7)	(8)	(9)	(10)
Share of men aged 18 to 55 working 50+ hours (calculated based on mean dependent variables)					
	-1.838***	-1.770**	-1.810***	-1.716**	-1.743**
	(0.219)	(0.303)	(0.225)	(0.284)	(0.235)
Share of individual of the different group working in the same industry-occupation i:					
Men	***		***		**
Observations	2,012	2,012	2,012	2,012	2,012
R-squared	0.527	0.241	0.541	0.235	0.419

Notes: The data is from 2002 to 2016 Labor Force Survey in Korea and Japan. The unit of observation is an industry-occupation cell by year.
The set of control variables include mean annual wage (won base), mean firm size, industry fixed effect, occupation fixed effect and year fixed effect.
Means and the shares are calculated by using provided sampling weights.
Standard errors are in parentheses and clustered within the industry.
*** p<0.01, ** p<0.05, * p<0.1

Table 4.5 Mean Working Hour of Men per Week and Share of Men aged 18 to 55 Working 50 Hours or More per Week, and the Share of College Educated Married Working Women with Children under Three and Without Children in Japan

	Share of college educated married women age to 55 working in industry-occupation i			
	Without children		With children under 3	
	(1)	(2)	(3)	(4)
Mean working hours per week (divided by 10) of men age 18 to 55 working in industry-occupation i (calculated based on mean dependent variables)				
	-0.139***	-0.124***	-0.116**	-0.102**
	(0.0158)	(0.0132)	(0.0143)	(0.0123)
Share of individual of the different group working in the same industry-occupation i:				
Men		*		Not significant
Observations	2,012	2,012	2,012	2,012
R-squared	0.249	0.364	0.209	0.287
	Without children		With child under 3	
	(1)	(2)	(3)	(4)
Share of men aged 18 to 55 working 50+ hours (calculated based on mean dependent variables)				
	-1.364**	-1.391***	-1.076*	-1.097**
	(0.189)	(0.166)	(0.195)	(0.165)
Share of individual of the different group working in the same industry-occupation i:				
Men		*		Not significant
Observations	2,012	2,012	2,012	2,012
R-squared	0.246	0.363	0.207	0.286

Notes: See Table4.5

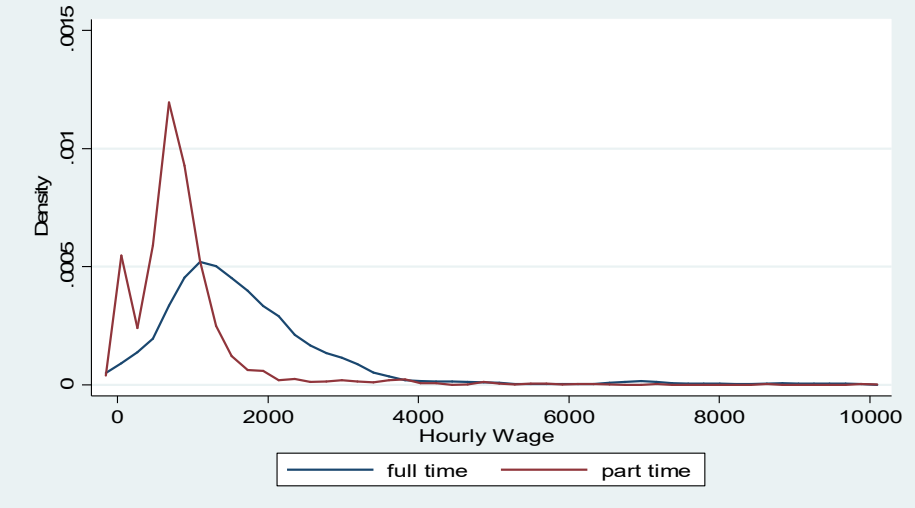
Table 4.6 Share of workers under 40-hour workweek system and Share of women age 18 to 40 working in industry-occupation in Korea

	Share of women age 18 to 40 working in industry-occupation i			
	Whole	Single	Married	College educated
	(1)	(2)	(3)	(4)
Share of workers under 40-hour workweek system in industry-occupation i(calculated based on mean dependent variables)				
	0.552	0.551	0.552*	-0.463
	(0.249)	(0.282)	(0.110)	(0.714)
Share of individual of the different group working in industry-occupation i:				
Men	***	***	***	
College educated Men				**
Observations	1,616	1,616	1,616	1,616
R-squared	0.517	0.480	0.199	0.538

Notes: Notes: The data is from 2002 to 2016 Labor Force Survey in Korea and Japan. The unit of observation is an industry-occupation cell by year.
The set of control variables include mean annual wage (won base), industry fixed effect, occupation fixed effect, year fixed effect and country fixed effect.
Means and the shares are calculated by using provided sampling weights.
Standard errors are in parentheses and clustered within the industry.
*** p<0.01, ** p<0.05, * p<0.1

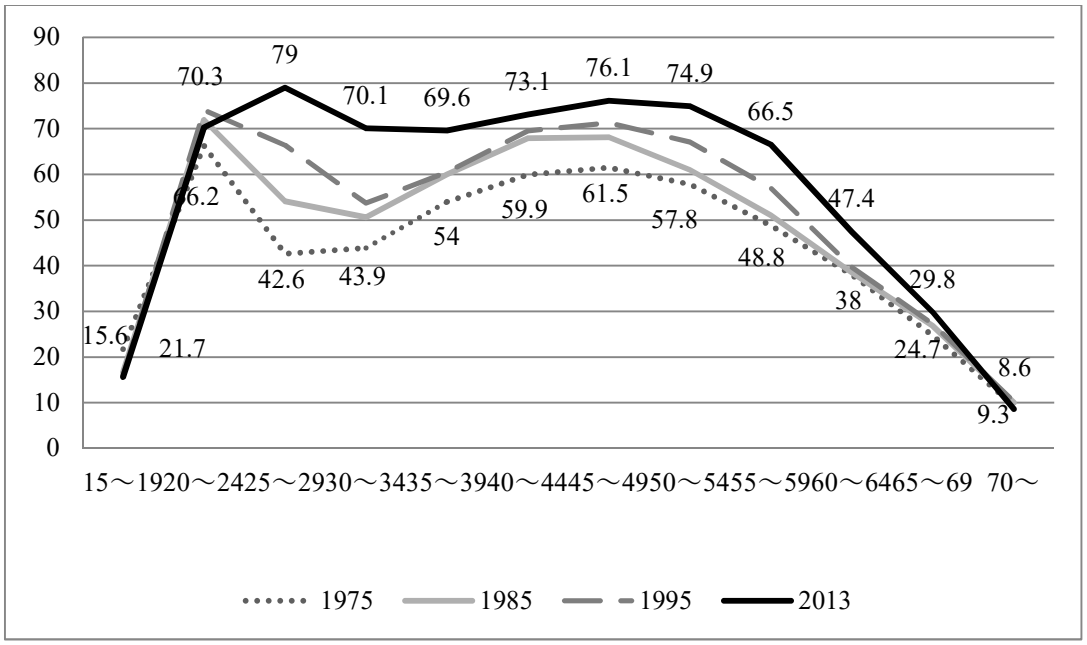
Figures

Figure 2.1 Distributions of the Hourly Wage: Fulltime and Part-time (Yen)



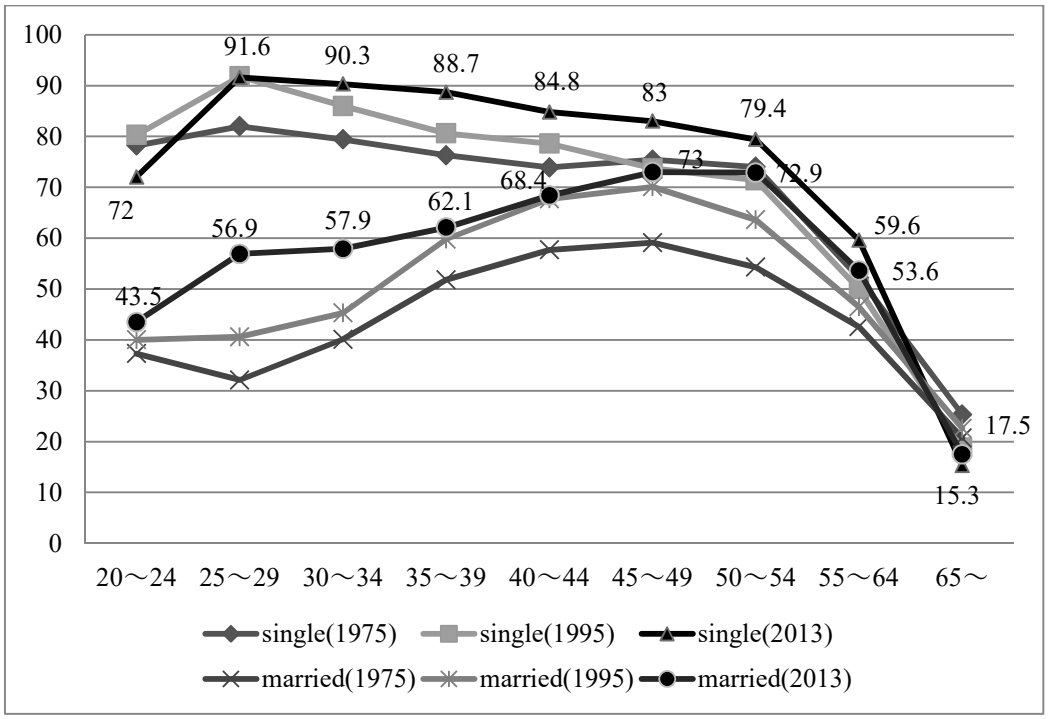
Notes: Data is from the National Survey of Households with Children (NSHC) in 2014 by the Japan Institute for Labour Policy and Training (JILPT)
Hourly wage is defined as annual wage including tax, social insurance premium, overtime allowance, bonus divided by 52 times of weekly average labor hours
The definition of full time is defined by “full time, regular and self-employed” and part time is defined by “consignment, contract employee, part timer, daily hire, family of self-employed, individual contractor”.

Figure 3.1 Trends in Women's Labor Force Ratio by Age Group



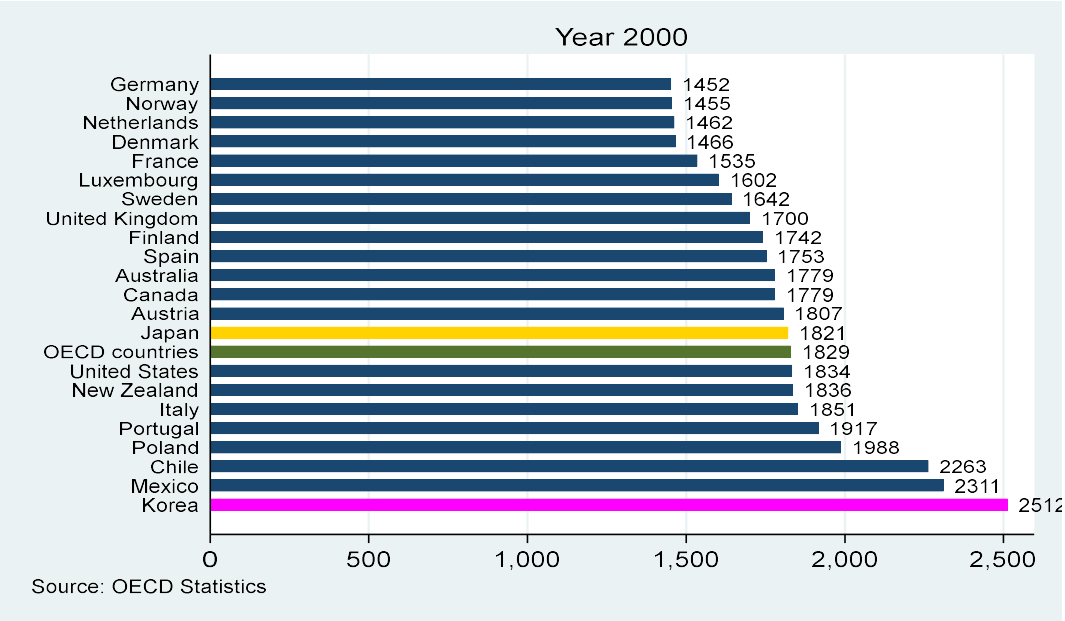
Source：White paper on gender equality in 2014 (Cabinet Office 2015)

Figure 3.2 Trends in Women's Labor Force Ratio by Marital Status and Age Group



Source：White paper on gender equality in 2014 (Cabinet Office 2015)

Figure 4.1 Mean Working Hour in OECD Countries



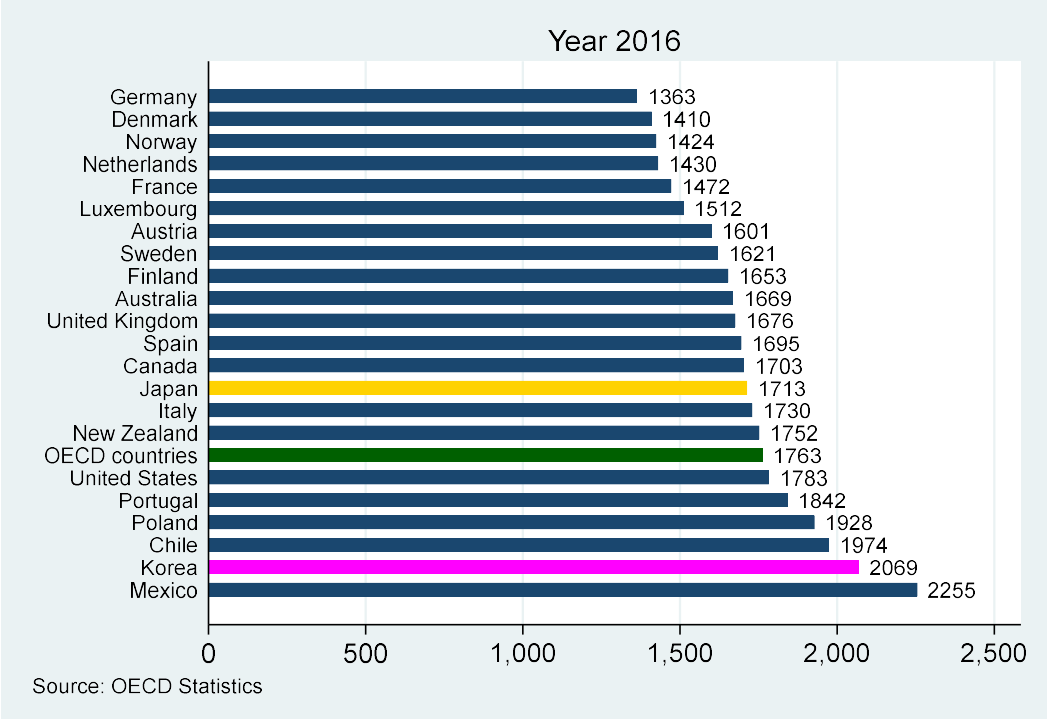
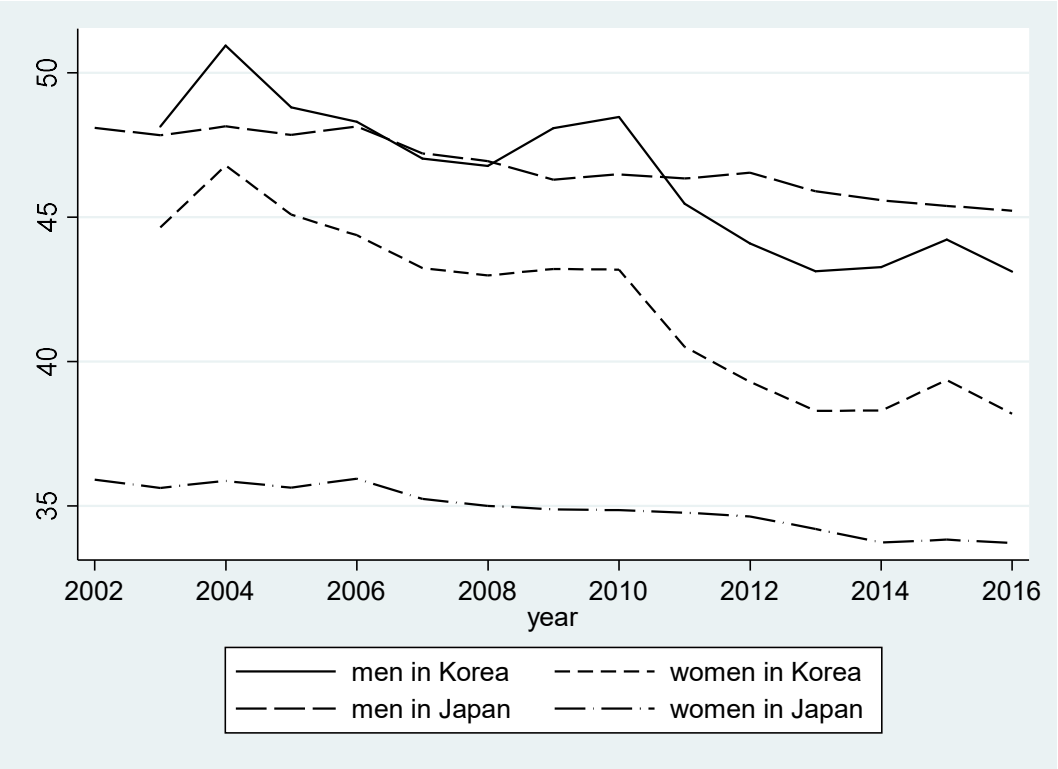
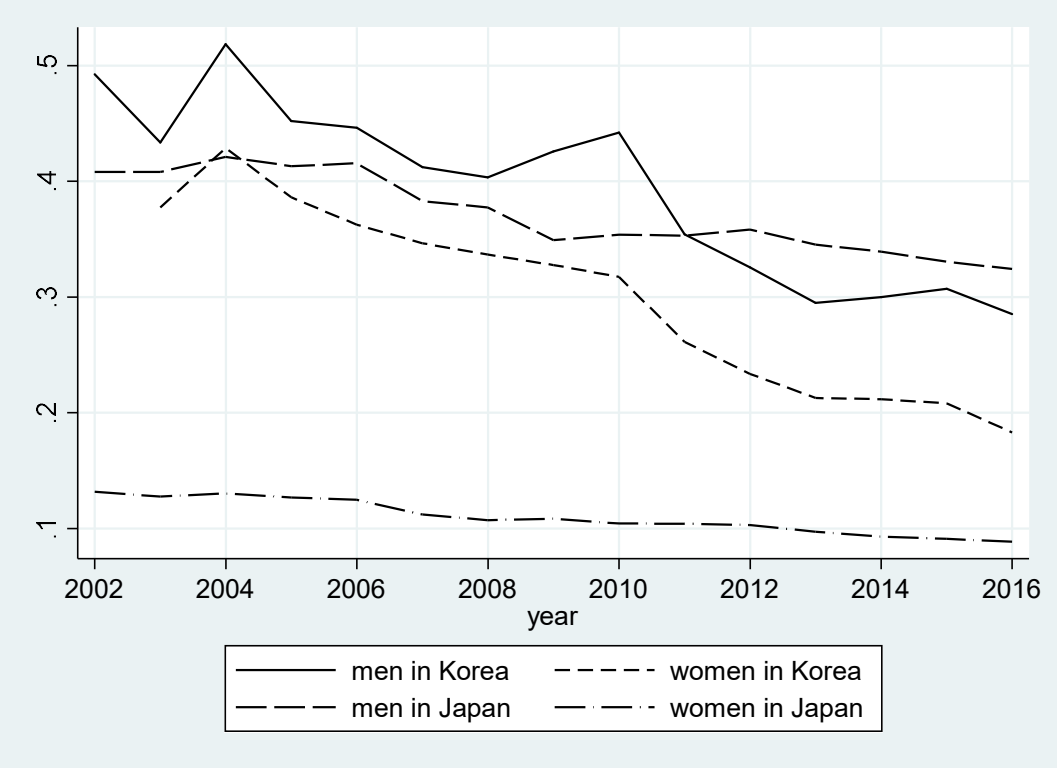


Figure 4.2 Mean Working Hour per Week in Korea and Japan by gender



Notes: Data is from the Labor Force Survey year 2002 to 2016 in Korea and Japan
Mean working hours are calculated by using provided sampling weights.

Figure 4.3 Trends of Overwork in Korea and Japan by Gender
(Share of Workers Working More Than 50 Hours per Week by Gender in Japan and Korea)



Notes: See Figure 4. 2.