Japan Labor Review

Special Edition

The Impact of the Equal Employment Opportunity Act in Japan

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The Impact of the Equal Employment Opportunity Act in Japan

Articles

Article Based on Research Report

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The summer 2013 issue of the Review will be a special edition devoted to **Current Situation of Workplace**.

Introduction

The Impact of the Equal Employment Opportunity Act in Japan

In 1947, the Labor Standards Act was enacted in Japan. Article 4 of this Act prohibits wage discrimination against women by reason of their gender, but Japan had no other statutes against gender discrimination in employment for nearly 40 years. This situation was changed upon the enactment of the Act on Securing, Etc. of Equal Opportunity and Treatment between Men and Women in Employment (hereinafter referred to as the "Equal Employment Opportunity Act").

The Equal Employment Opportunity Act, when initially enacted in 1985, was the first law to prohibit employers from discriminating against women by reason of their gender in terms of the mandatory retirement age, dismissal, and access to education/training as well as to some fringe benefits. However, some points in this Act needed to be corrected in that: (i) literally it only required employers to "make efforts" to avoid discrimination against women in recruitment, assignment, and promotion, in consideration of the gender consciousness and employment practices prevailing in society at that time; and (ii) while restricting disadvantageous treatment of women, it was not concerned with the problem of disadvantageous treatment of men. Subsequently, this Act was revised in 1997 to prohibit discrimination against women by reason of their gender in recruitment, assignment and promotion, and was further revised in 2006 to prohibit discrimination against men, introduce provisions regulating indirect discrimination, and clearly codify the prohibition of disadvantageous treatment of female workers by reason of marriage, pregnancy, childbirth, etc.

Thus, the Equal Employment Opportunity Act has become more substantial through these major revisions made in about ten-year intervals, and has passed the quarter-century milestone since its enactment until today.

Also during this period, progress has been made with regard to such measures as supporting workers in achieving both family and work life, which may be indispensable for realizing gender equality in employment. For example, the Act on the Welfare of Workers Who Take Care of Children or Other Family Members Including Child Care and Family Care Leave was enacted in 1991 and has undergone repeated revisions.

As the Equal Employment Opportunity Act took a long time to be developed into what it is now, it also takes a long time for any change to the legal system to bring about change in society, and any change in society will create new challenges to the legal system. Now, more than a quarter-century has passed since the enactment of the Equal Employment Opportunity Act, and it is time for us to review how this Act and other laws, as well as the measures to support achieving compatibility between family and work life, have contributed to realizing gender equality in the Japanese labor society, and based on the review results, to look into the issues that remain in these laws and measures.

From this viewpoint, the Special Edition of this issue of *Japan Labor Review* has selected papers discussing the impact that the Equal Employment Opportunity Act has had on the Japanese labor society as well as the issues that remain to be addressed with regard to this Act and the measures implemented to date to support workers in achieving both family and work life. Specifically, these papers focus on the following topics: the history and issues of the Equal Employment Opportunity Act; the long-term impact of this Act on the labor market; the impact of this Act on the human resources management of women at companies; and the causes of the persistent gender inequality in the labor market and the measures to rectify it.

Yamada provided an overview of the history of the Equal Employment Opportunity Act in three phases, namely, from the enactment in 1985 until the revision in 1997, from the 1997 revision until the revision in 2006, and from the 2006 revision until now. He confirmed that through the revisions in 1997 and 2006, this Act has undergone various changes, such as: (i) transforming from a mild law that only provides for the obligation for employers to make efforts to avoid discrimination, into a strict law that clearly prohibits discrimination; (ii) transforming from a law to prohibit discrimination only against women, into a law to prohibit discrimination by reason of gender, including discrimination against men; (iii) introducing provisions concerning sexual harassment; (iv) introducing prohibition of indirect discrimination; and (v) clarifying prohibition of discrimination against women by reason of pregnancy and childbirth, and expanding the scope of prohibition. Based on the understanding of its current status, Yamada then pointed out issues with this Act that remain to be addressed, namely: (i) introducing prohibition of discrimination by reason of marital status; (ii) re-considering the concept of discrimination to be prohibited under this Act; (iii) using positive action; and (iv) enhancing remedies for discrimination.

Abe surveyed the impact of the Equal Employment Opportunity Act on labor market outcomes of women in Japan, through the literature review from the following viewpoints. The first point is the status of women's participation in the labor market. According to Abe, after the enactment of the Equal Employment Opportunity Act, regular (full-time) employment rose among highly educated women (graduates of university or higher education) younger than age 40, but the increase in regular employment was not outstanding for those over age 40, even among highly educated women. For both married and non-married groups, the regular employment ratio did not increase between before and after the enactment of this Act, and Abe pointed out that this suggests that the increase in regular employment among highly educated women younger than age 40 only reflects the increase in the regular employment ratio among single women, which is basically higher than that among married women. The second point is the wage gap and tenure gap between men and women. Abe explained that both the wage gap and the tenure gap by gender have become narrowed for less-educated middle-aged women after the enactment of the Equal Employment Opportunity Act, whereas such improvements cannot be found for highly educated young women. The third point is regional differences of the impact of this Act, that is, there are regional

differences in the increases in regular employment of highly educated women younger than age 40, with the most significant increase in Tokyo. Finally, Abe concluded that the Equal Employment Opportunity Act caused increasing regular employment for highly educated, single (unmarried) women but did not increase the number of women who achieve family and career.

Kawaguchi studied the situation after the enactment of the Equal Employment Opportunity Act, focusing on (i) the aims of the government's formulation of policies concerning work-life balance (WLB) and the intentions of companies in introducing systems relating to WLB, and (ii) the impact of the measures to support achieving compatibility between work and family life on employment of women, such as the retention rate of female workers. Kawaguchi's findings are as follows. Firstly, the government's main objective of promoting WLB-related policies is to counter the declining birthrate, and most companies introduce measures to promote a better work-life balance basically as part of their efforts to make a contribution to society, while some companies implement these measures with the expectation that this will improve the motivation of female workers and increase their retention within the company. Secondly, over the last 20 years, the retention rate of female workers has gradually but steadily increased, thanks to the WLB-related policies promoted by the government and the WLB-related measures introduced by companies. At the same time, women's relative wage has also risen, although the rise is very sluggish. Since 2000, the proportion of female managers has also increased. Thirdly, comparing individual companies, the more assiduous the senior management at a company is about measures to promote a better work-life balance, the higher the level of female retention, and the higher the level of female retention, the more successful women are in a company.

Wakisaka looked at transitions in the human resource management of women at companies following the enactment of the Equal Employment Opportunity Act. He first pointed out that the system of double-tracked personnel management was introduced around the time that this Act was enacted, primarily at large corporations. The major objective of introducing this system is to recruit women who are capable and aspiring to work for many years, thereby dealing with the great disparity between men and women in their separation rates. However, the system has not sufficiently contributed to increasing the retention rate of female workers because it has not been able to adapt to women's tendency to change their ideas about life course while building their career. Wakisaka also indicated that, especially following the enactment of the Act on the Welfare of Workers Who Take Care of Children or Other Family Members Including Child Care and Family Care Leave, in order to increase the retention of women, companies have become positive in introducing systems to support achieving compatibility between work and family life, such as a child care leave system and short-time work system for child rearing, in the context of human resource management of women. With regard to the child care leave system and short-time work system for child rearing, in particular, he identified problems such as the difficulty in securing replacement personnel, the decline of abilities while on leave, and disadvantages in

assessment of staff on leave or short-time work.

Estévez-Abe inquired into why gender inequality remains so persistently in the Japanese labor market even after a quarter-century has passed since the enactment of the Equal Employment Opportunity Act, and discussed how to cope with this problem by comparing the situation in Japan with other developed nations, such as the United States and Sweden. As institutional conditions for realizing gender equality in employment, she mentioned: (i) an extensive policy for enabling mothers to balance work and family life; (ii) strong anti-discrimination laws matched with class action suits, (iii) the presence of professionally-oriented educational systems that allow women with academic abilities entry into high status occupations; (iv) market conditions that enable women to outsource their unpaid domestic work; and (v) availability of contraceptive methods that give women control over their reproductive decisions. Through international comparison, she indicated that Japan lags behind other advanced countries in implementing these measures and that this causes gender inequality to remain in the Japanese labor market. Based on these findings, she asserted the necessity of the policy intervention by the government in the form of affirmative action for gender equality, including the introduction of quotas—equivalent to sanctions in class-action suits in the United States—, and the promotion of outsourcing housework and childcare services.

One notable point highlighted in the papers in the Special Edition is the importance of the measures to support workers in achieving both work and family life, in the process toward the goal of gender equality in employment. I hope that these papers will contribute to identifying the realities of treatment of men and women in the Japanese labor society and to enhancing research and policy-making in the pursuit of realizing gender equality, while promoting the measures to support achieving compatibility between work and family life.

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Equal Employment Opportunity Act, Having Passed the Quarter-Century Milestone

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A quarter-century has passed since the enactment of the Act on Securing, Etc. of Equal Opportunity and Treatment between Men and Women in Employment. When this Act was initially established, its scope of regulations and legal effect were not sufficient, and it had the nature of a law to provide protection from discrimination only for women workers. However, through the revision in 1997 and 2006, the Act has transformed into a law against gender discrimination in a precise sense, and it currently contains not only the anti-discrimination provisions but also the provisions regarding positive action and sexual harassment. This paper reviews the history of the Act while explaining the legal issues that were discussed in the enactment and revision process, and identifies the issues with the Act that remain to be addressed, such as the concept of discrimination under the Act, the relationship between freedom of recruitment and prohibition of discrimination, and how to ensure effective positive action.

I. Introduction

The Act on Securing, Etc. of Equal Opportunity and Treatment between Men and Women in Employment (hereinafter referred to as the "Equal Employment Opportunity Act" or the "Act") was established as Japan's first comprehensive law that prohibits discrimination against the following background.

The United Nations (UN) made 1975 the International Women's Year, with the objective of enhancing the efforts to further gender equality, realize full participation of women in the overall life planning, develop friendly and cooperative relations among nations, and recognize an increasing contribution by women toward strengthening the world peace. After that, the UN proclaimed the decade from 1976 to 1985 "United Nations Decade for Women," and in 1979—the midpoint of this decade—, adopted the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW), which requires the Member States to take all appropriate measures, including legislation, to eliminate discrimination against women in all fields including employment (effective in September 1981).

Responding to such movements led by the UN, Japan also set up the Headquarters for the Planning and Promoting of Policies Relating to Women in 1975, following the end of the first World Conference on Women, and laid down a National Plan for Action in 1977, and finally, enacted the Equal Employment Opportunity Act in 1985 in order to meet the conditions for ratifying the CEDAW.

Before the enactment of the Equal Employment Opportunity Act, Article 4 of the

Labor Standards Act which provides for the principle of equal pay for equal work for men and women had been the only rule under labor law for prohibiting discrimination against women. Therefore, at that time, when challenging discriminatory labor practices against women except for wage discrimination, women had had no legal basis to rely on other than the general rules under the Civil Code, that is, the law of public policy (Article 90) regarding juridical acts and the tort law (Article 709) regarding other acts. For instance, the following labor practices were judged to be against public policy: the system for requiring only women to leave jobs upon marriage (Sumitomo Cement Case, the judgment of the Tokyo District Court, December 20, 1966, 17 *Rodo Kankei Minji Saibanreishu* 1407); dismissal of a women worker by reason of her marriage (Hokoku Sangyo Case, the judgment of the Kobe District Court, September 26, 1967, 18 *Rodo Kankei Minji Saibanreishu* 915); the system for requiring women to retire at a younger age than men (Tokyu Kikan Kogyo Case, the judgment of the Tokyo District Court, July 1, 1969, 20 *Rodo Kankei Minji Saibanreishu* 715); the system for requiring women to leave jobs upon childbirth (Mitsui Engineering and Shipbuilding Case, the decision of the Osaka District Court, December 10, 1971, 22 *Rodo Kankei Minji Saibanreishu* 1163); and the system for requiring women to retire five years younger than men (Nissan Motor Case, the judgment of the Third Petty Bench of the Supreme Court, March 24, 1981, 35 *Saikosai Minji Saibanreishu* 300). Meanwhile, after the Equal Employment Opportunity Act took effect, in the case in which female employees of a local government—who are excluded from the application of this Act—complained about the criteria for encouraging women to retire at a younger age than men, the court judged that encouraging these employees to retire according to such criteria constitutes a tort (Tottori Prefecture Board of Education Case, the judgment of the Tottori District Court, December 4, 1986, 486 *Rodo Hanrei* 53). Although containing this exception to government employees, the Equal Employment Opportunity Act started its life as Japan's first comprehensive anti-discrimination law.

According to a survey, in 2011, which marked the 25th anniversary of the Equal Employment Opportunity Act, the number of women workers was 26.32 million persons (down 0.4 % year on year), and the ratio of women of all workers was 42.0%, remaining at the same level as the previous year.[1] Looking at the wage gap between men and women in 2011 on the basis of predetermined salary, that is, the women's salary as a percentage of men's salary, among regular employees (excluding part-time workers), women's scheduled cash earnings were 71.9% (up by 1.4% year on year) and their predetermined salary was 73.3% (up by 1.2% year on year) of men's, while among non-regular employees, the former was 73.9% (up by 1.8% year on year) and the latter was 77.5% (up by 2.8% year on year). Thus, the wage gap by gender has been diminishing, but the wages difference between men

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[1] 21st Century Job Foundation, *Josei Rodo no Bunseki 2011* [Analysis of women's work 2011] (21st Century Job Foundation, 2012), 2.

and women is the highest in the developed countries.[2] As for the actual conditions of women's promotion, the rate of promotion of female managers increased during the period between 1980 and 2011 from 1.0% to 5.1% among section chiefs and from 3.1% to 15.3% among subsection chiefs, thus showing a less than-satisfactory but certain degree of upward trends over a period of nearly 30 years.[3]

Although it may be difficult to statistically demonstrate to what extent the anti-discrimination laws, including the Equal Employment Opportunity Act which is the main topic of this paper, have contributed to improving the situation concerning gender equality in employment, it can at least be said that this Act did have a significant influence.

This paper reviews the legislative process and revision history of the Equal Employment Opportunity Act that has passed the quarter-century milestone since its enactment in 1985, while referring to the court rulings involving this Act, with the objective of identifying the issues for the future.

II. Developments of the Equal Employment Opportunity Act

Since its enactment in 1985 until today, the Equal Employment Opportunity Act has undergone revision twice, in 1997 and 2006. The initial and revised versions of this Act are explained in detail below.

1. The 1985 Act

The 1985 Act pressed for a big change in Japan's legal framework for gender equality in employment, by attempting to prohibit discrimination in all stages of employment, from recruitment, to assignment, promotion, education/training, and to termination of employment (including dismissal and mandatory retirement).[4] However, the 1985 Act had some shortcomings in that (a) it designated only women as the subject of its anti-discrimination provisions (one-sided protection against discrimination), and (b) it did not literally prohibit employers from treating employees in a discriminatory manner but only required them to try to avoid such treatment in recruitment, assignment and promotion (Articles 7 and 8), which are important factors in the context of prohibition of discrimination.

On point (a), the conventional recruitment approaches such as limiting eligible candidates to "university graduates in the case of men and university or junior college graduates in the case of women" or limiting the available employment status to "full-time em-

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[2] *Id. at* 26.
[3] *Id. at* 165.
[4] As prohibition of wage discrimination between men and women is provided for in Article 4 of the Labor Standards Act, the Equal Employment Opportunity Act provides for other types of gender discrimination, such as discrimination in recruitment and working conditions. Specifically, Article 4 of the Labor Standards Act prohibits the application of different wage schedules or different initial salaries between men and women, whereas any wage gap caused by gender discrimination in assignment or promotion shall be regulated under the Equal Employment Opportunity Act.

ployment in the case of men and full-time and part-time employment in the case of women" were regarded as treating women "more favorably" than men, and for this reason, they were not considered to be in violation of the Equal Employment Opportunity Act. However, in reality, these recruitment approaches led to recruitment of "men who graduated from university and women who graduated from junior college" or "full-time male employees and part-time female employees." It is ironic that placing emphasis on one-sided protection and allowing preferential treatment for women under the new legislation instead resulted in letting discrimination against women be preserved. In the first place, the legislation of such preferential treatment for women should have been dealt with as an issue of positive action for the benefit of women to the necessary extent while prohibiting discrimination against both genders.

On point (b), the reason why the 1985 Act only required employees' efforts to avoid discriminatory treatment in recruitment, assignment and promotion instead of literally prohibiting such treatment has been accounted for quite often from the standpoint of the purpose or principle of the Act, i.e. gradual advancement. Specifically, based on the proposal of the Council for Women that, "Enactment, revision or repeal of any law must look into the future but must not lose touch with the present situation," the legislative purpose was explained as follows: (i) consideration should be given to the present situation of the Japanese society and economy in relation to women's work, including their actual conditions of work and job attitudes, employment practices and social notions regarding women's work; (ii) under the employment management system adopted by Japanese firms, which was based on the prerequisite of lifelong commitment, the length of service was considered as an important factor and the average gender gap in terms of this factor cannot be ignored; and (iii) accordingly, in the areas of recruitment, assignment and promotion, where employment is managed in consideration of the length of service expected for the future, it would be appropriate to place employers under the obligation to make efforts for the time being.[5]

Another argument provides the following explanation. This obligation to make efforts was codified in such a situation where the gender role-based employment system existed and the job attitudes of men and women were in alignment with this system, while, on the other hand, the measures to protect women under the Labor Standards Act that contradict the principle of gender equality (e.g. prohibition of assignment of women to night work, restrictions on assignment of women to overtime work and work on days-off) cannot be abolished in the face of the reality that women assume many duties at home. Therefore, the 1985 Act did not adopt the form of a 'hard law' (a binding law) for the entire scope of regulations but partially chose the form of a 'soft law' by stipulating the obligation to make efforts, and aimed at urging employers to change their attitudes and employment practice by

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[5] It is construed that the breach of the obligation to make efforts could constitute breach of public policy. Shintaro Shirai, *Danjo Koyo Kikai Kintoho Kaisei Rodo Kijunho no Jitsumu Kaisetsu* [Commentary on practice under the Equal Employment Opportunity Act and the Revised Labor Standards Act] (Institute of Labor Administration, 1985), 57–58.

way of the administrative guidance to be issued according to the guidelines in which the details of this obligation are specified, so that the principle of gender equality would permeate the society.[6]

However, these arguments cannot be justified because it is irrational that the Equal Employment Opportunity Act, which was established for the purpose of eliminating gender-oriented discriminatory employment practice, was forced to restrain from providing for strict rules in consideration of the employment management system currently operated by firms, and because taking into consideration women workers' length of service in the process of making a law is equal to adopting the theory of statistical discrimination and it is contradictory in legal terms for the Equal Employment Opportunity Act, which must prohibit statistical discrimination, to use this factor as its basis.[7] And the most serious point among all things is that equality under the law—a human right guaranteed under Article 14 of the Constitution—is guaranteed only by means of the obligation to make efforts. It should be remembered that the basic policy of the Act is that the principle of gender equality must be interpreted focusing on individual men and women rather than viewing them as gender groups, in line with the principle of respect for individuals under Article 13 of the Constitution.

The 1985 Act codified the prohibition of discrimination in terms of the access to education/training and fringe benefits. However, as for the former, it limited the scope of measures subject to prohibition of discrimination to off-the-job training, and excluded on-the-job training that was absolutely necessary for employees to develop their ability to perform duties. Moreover, it only confirmed by statute of the case law that discriminatory treatment for women in relation to termination of employment (including mandatory retirement and dismissal) constitutes the breach of public policy.

Embracing these limitations as described above, however, the 1985 Act undoubtedly took the first step as Japan's first comprehensive law on discrimination against women (due to such nature, this situation was metaphorically described as "Have a small baby and raise the baby to grow big").

2. The 1997 Act

The most important revision incorporated in the 1997 Act is that the Act transformed the abovementioned obligation to make efforts to avoid discriminatory treatment in recruitment, assignment and promotion, into the prohibition of such treatment. Other areas of revision include the codification of employers' obligation to give consideration to sexual harassment at the workplace, and the abolition of the limitation to make all education-

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[6] Takashi Araki, *Rodoho* [Labor law] (Yuhikaku, 2010), 87.

[7] According to the administrative interpretation of Article 4 of the Labor Standards Act, it would be in violation of this Article to discriminate against women in terms of wage by reason of "their lower efficiency in general or in average, shorter period of service, or not being the primary breadwinner, etc."

al/training programs subject to prohibition of discrimination. These changes deserve appreciation.

The transformation of the obligation to make efforts to implement equal treatment in recruitment, assignment and promotion into the prohibition of discriminatory treatment, achieved by the 1997 Act (Article 6), had an immediate impact on court rulings. In the Nomura Securities Case, female employees claimed illegality of the gender-segregated career system (recruiting and assigning men to the main, managerial career track and women to routine, clerical work, and discriminating between men and women in treatment, promotion and other aspects; the judgment of the Tokyo District Court, February 20, 2002, 822 *Rodo Hanrei* 13). The court judged that this career system was illegal under Article 6 of the 1997 Act and therefore should be declared void from April 1, 1999, the day on which the Act incorporating the prohibition of discrimination in job assignment took effect; however, until that day, employers had only been required to make efforts to avoid such discrimination, and therefore the career system in dispute cannot be regarded as violating the Equal Employment Opportunity Act (this reasoning was also confirmed in the Okaya Koki Case, the judgment of the Nagoya District Court, December 22, 2004, 888 *Rodo Hanrei* 28). Thus, according to the basic standards seen in the past court rulings, April 1999—when the 1997 Act took effect—was considered to be the turning point for making the prohibition of discrimination in recruitment, assignment and promotion legally effective.

However, even though the Act requires employers to avoid discrimination only in the form of the obligation to make efforts, they must assume this obligation in legal terms, and if they neglect the obligation required by law, nothing would preclude finding their conduct to be against public policy. This reasoning was affirmed by the judgment of the Tokyo High Court, through the medium of the theory of rule of private law over employment relationships. In the Showa Shell Sekiyu Case (the judgment of the Tokyo High Court, June 28, 2007, 946 *Rodo Hanrei* 76), the court held that Article 8 of the 1985 Act which provides for employers' obligation to make efforts to avoid discrimination imposes a statutory obligation on employers to make such efforts, and hence, if employers make no efforts to achieve this purpose and do not try to implement equal treatment but willfully maintain unequal treatment, or they take measures to further increase gender discrimination in assignment and promotion, their conduct runs counter to the spirit of said Article and should be made subject to the administrative guidance to be issued by the Minister of Health, Labour and Welfare, and what is more, the rule of private law over employment relationships, based on which the illegality of an alleged tort should be determined, also covers the spirit of said Act as described above.

Another notable change through the 1997 revision is the introduction of employers' obligation to give consideration to sexual harassment in the course of employment management, which led to the establishment of the Sexual Harassment Guidelines. Specifically, these guidelines provided for the three major tasks that employers must undertake as their obligation to give consideration to sexual harassment: (i) clarify the policy for dealing with

sexual harassment (stipulating it in the rules of employment, setting out disciplinary rules, etc.) and increase employees' awareness thereof (conducting training, etc.); (ii) deal with complaints and requests for consultation (clarifying the consultation and complaint handling section, making appropriate and flexible response upon request for consultation, etc.); and (iii) take prompt and proper measures ex post facto.

It may be natural to argue that as long as sexual harassment can be dealt with under the provisions of the Penal Code and the Civil Code (especially the provisions on tort), there is no need to incorporate provisions on sexual harassment into the Equal Employment Opportunity Act, as if *gilding the lily*. However, on a daily basis in the workplace, women workers feel unconformable due to men's sexual words and deeds which may not be found to constitute a tort (a tort cannot be established unless the alleged conduct violates the victim's rights or legal interest; Article 709 of the Civil Code). The provisions on sexual harassment under the Equal Employment Opportunity Act should be understood as aiming to eliminate such a situation and create a working environment where women can work free from anxiety. Accordingly, employers are supposed to have the obligation to create a working environment that respects the personal interest of (women) workers (e.g. the obligation to give consideration to and improve the working environment), as an incidental obligation under the employment contracts.

At any rate, it is at least worth noting that the provisions on the obligation to give consideration to women workers on sexual issues were incorporated into the Equal Employment Opportunity Act, which prohibits discrimination based on gender roles.

The third key point in revision is that the 1997 Act introduced the concept of positive action (measures to eliminate discrimination that is actually taking place between men and women) for the purpose of rectifying a long period of accumulated discrimination against women, and as a result, consultation and other support programs financed by the national government were established. In view of the fact that it is substantially difficult for women workers to bring their complaints about discrimination to court, positive action is indispensable as a mechanism that encourages employers to eliminate discrimination voluntarily.

As reviewed thus far, the 1997 Act expanded the scope of rights of women workers as compared to the 1985 Act, but it maintained its nature as a law to provide protection from discrimination only for women workers. For this reason, the scope of workers eligible for protection under employers' obligation to give consideration to sexual harassment introduced under the 1997 Act was limited to women workers.

3. The 2006 Act

The currently effective revision to the Equal Employment Opportunity Act was enacted in 2006 and put into effect in April 2007.

The biggest change under the 2006 Act was the transformation from a law to prohibit discrimination against women into a law to prohibit gender discrimination, covering discrimination against men as well. What should have been discussed in the revision process

was the essence of "equality"—*What is equality?*—, an issue that is related to the nature of the Act. Historically, the Act had existed as a law to prohibit discrimination against women, and the targeted level of equality was clear, that is, bringing the situation of women up to the same level as men. On the other hand, if the lawmakers intended to design a law to prohibit gender discrimination, they ought to have questioned, in the first place, where they should place the basis for gender equality or which direction the ideal of gender equality should aim at, or more specifically, they should have necessarily considered how to incorporate the concept of work-life balance into the Act.

Despite that, the relation between gender equality and work-life balance was regarded as an issue to be left under the jurisdiction of the Child Care and Family Care Leave, and even the concept of harmony between work and private life, provided in Article 3 of the Labor Contract Act, was not introduced to the Equal Employment Opportunity Act. However, considering that achieving an appropriate work-life balance is an inevitable task in the course of realizing gender equality (the issue of work-life balance is often discussed in the context of child care and family care but it also concerns workers who live alone), the Equal Employment Opportunity Act must also incorporate measures as necessary, including the measures to prevent men from working long hours.

Along with the transformation from the law to prohibit discrimination against women to the law to prohibit gender discrimination, employers' obligation to give consideration to sexual harassment against women in the course of employment management was replaced with their obligation to take employment management measures to protect both men and women from sexual harassment at the workplace, as might be expected.

The overwhelming majority of sexual harassment cases involve women as victims and men as harassers (or alleged harassers). So far, there is only one exception to this, the Japan Post (Kinki Postal Administration Bureau) Case (the judgment of the Osaka High Court, June 7, 2005, 908 *Rodo Hanrei* 58). In this case, a female superior was alleged to have conducted sexual harassment against her male subordinate by taking a leave of absence for a few hours, entering the public bath situated at the workplace, and staring at the subordinate's naked upper body. While the court of first instance found sexual harassment (the judgment of the Osaka District Court, September 3, 2004, 884 *Rodo Hanrei* 56), the court of second instance denied it. As it is shown in this case, whether the same criteria should be applied to men and women for finding sexual harassment remains to be further discussed as an important issue relating to corporate employment management.

The second most important change under the 2006 Act is the introduction of the prohibition of indirect discrimination (Article 7; taking measures which are based on conditions other than sex but could virtually result in discrimination by reason of sex), in addition to direct discrimination by reason of sex (being female or male). This change is a welcome advance to overcome the difficulty in submitting proof of direct discrimination.

According to the report of the Equal Employment Opportunity Policy Meeting, released in June 2004, the following measures may constitute indirect discrimination: (i) re-

quiring a standard height, weight and physical strength as a condition for recruitment; (ii) requiring the availability for nationwide transfer as a condition for recruitment for the main career track; (iii) requiring a standard academic level (including the major subject) as a condition for recruitment; (iv) requiring the experience of a transfer that required relocation of residence as a condition for promotion; (v) requiring the status of the head of a household recorded in the residence certificate (e.g. being the primary breadwinner or having dependents) as a condition for receiving fringe benefits or family allowances, etc.; (vi) treating full-time workers more favorably than part-time workers; and (vii) excluding part-time workers from the scope of workers eligible to receive fringe benefits or family allowances, etc. However, the 2006 Act only designated three measures as measures to be prohibited as indirect discrimination, namely, (i) the condition for recruitment relating to a worker's height, weight and physical strength, (ii) the condition for recruitment for the main career track requiring a worker's availability for nationwide transfer, and (iii) the condition for promotion requiring the worker to have the experience of a transfer (Article 2 of the Ordinance for Enforcement of the Equal Employment Opportunity Act).

Providing a limited list of measures prohibited as indirect discrimination in this manner cannot be seen in legislation anywhere else in the world. Also in consideration of the fact that the essential concept of indirect discrimination is an attempt to review and reform the conventional, male-centered practices at the workplace, such legislative methodology of limiting the prohibited measures does not match the concept of indirect discrimination itself. Some of the abovementioned measures that are likely to result in indirect discrimination, for example, the requirement of the status of the head of a household, may not be regarded as violation of the Equal Employment Opportunity Act but need to be examined from the perspective of whether they are against public policy.

The third key point in revision is that the 2006 Act has expanded the scope of prohibition of discrimination against women workers by reason of pregnancy, childbirth, etc. In particular, while the provisions prior to revision only prohibited employers from dismissing women workers who have become pregnant, delivered a child or taken a maternity leave before or after childbirth, the revised Act also prohibits employers from giving other disadvantageous treatment to such women workers (Article 9, paragraph [3]).

There is no doubt that this new provision is the legislation of the judgment framework employed in the Toho Gakuen Case (the judgment of the First Petty Bench of the Supreme Court, December 4, 2003, 862 *Rodo Hanrei* 14), in which the court found breach of public policy in respect of the regulations for bonus payment that required employees to attend work for 90% or more of the period subject to assessment in order to receive a bonus, and treated those who have taken a maternity leave after childbirth, child care leave, and menstrual leave as having been absent from work.

In this case, the Supreme Court explained that a measure that gives disadvantageous treatment to women workers by reason of their exercise of the rights guaranteed under laws such as the Labor Standard Act and the Child Care Leave Act does not immediately consti-

tute a breach of public policy but it is regarded as such and declared void only where such measure restrains women workers from exercising the rights guaranteed by law, namely, the right to take a maternity leave after childbirth under Article 65, paragraph (2) of the Labor Standards Act, and seems likely to substantially deprive them of these legally guaranteed rights. At the same time, the Supreme Court also mentioned that even if said regulations for bonus payment are void, it is permissible for the employer to treat the female employee who took a maternity leave after childbirth, etc. as having been absent from work for the period of such leave in the process of calculating the amount of bonus, and acknowledged the legality of the payment of bonus according to the actual rate of attendance at work. According to the Supreme Court's logic, the principle of no work, no pay, is applicable to the period of a maternity leave after childbirth, etc., and hence such leave may be treated in the same manner as an ordinary absence from work.

This logic is incorporated into the Gender Discrimination Guidelines, which exemplify the following as "dismissal or other disadvantageous treatment" prescribed in Article 9, paragraph (3) of the Equal Employment Opportunity Act: (i) dismissal; (ii) refusal to renew the fixed-term contract; (iii) reduction of the number of contract renewals; (iv) compulsion of an amendment to the terms of the labor contract; (v) demotion; (vi) violation of the working environment; (vii) disadvantageous order to stand by at home; (viii) wage reduction and disadvantageous calculation of bonus; (ix) disadvantageous performance evaluation; (x) disadvantageous job reassignment; and (xi) the client company's refusal to receive services of a dispatched worker. Among these items, a question arises as to (viii), the case where a reduction of bonus, etc. constitutes disadvantageous treatment. According to the guidelines, such case is found only in the following situation: "where the employer calculates the amount of bonus or retirement allowance to be paid while taking into account the period of absence from work or decline in labor efficiency, and in the calculation process, the employer gives disadvantageous treatment to employees who were absent from work or whose labor efficiency declined due to pregnancy or childbirth, compared to those who were absent from work for the same period or whose labor efficiency declined to the same level due to sickness"; and "where the employer calculates the amount of bonus or retirement allowance to be paid while taking into account the period of absence from work or decline in labor efficiency, and in the calculation process, the employer treats employees as having been absent from work or having shown a decline in labor efficiency beyond the actual period of absence from work or actual rate of decline in labor efficiency due to pregnancy or childbirth." Thus, there is no doubt that the Gender Discrimination Guidelines were established as a confirmation of the abovementioned Supreme Court judgment in the Toho Gakuen Case.

Then, how should we construe the legal effect of such measures that give disadvantageous treatment by reason of the exercise of rights guaranteed by laws, such as the right to take a maternity leave before or after childbirth? The Supreme Court held that such disadvantageous treatment would be judged to be against public policy and declared void only if

it restricts the exercise of rights and substantially nullifies the legally guaranteed rights. However, when it comes to the right to take a leave upon pregnancy or childbirth or for childrearing, women workers have to take a leave immediately when the necessity arises (men may also have to take a leave for childrearing). With respect to a maternity leave after childbirth, which was treated as an absence from work in the abovementioned Toho Gakuen Case, it must not be forgotten that the employer is prohibited from having women work and women are also prohibited from attending work within six weeks after childbirth under any circumstances (see Article 65, paragraph [2] of the Labor Standards Act). From this standpoint, it is inappropriate to simply apply the no work, no pay theory to workers' taking leave by exercising the rights guaranteed by the Labor Standards Act or the Equal Employment Opportunity Act, but it is instead necessary to re-examine the nature of the rights embodied in a child care leave, etc.

The last noteworthy point of the 2006 Act is the introduction of the provisions that dismissal of women workers who are pregnant or in the first year after childbirth shall be void (Article 9, paragraph [4]). In ordinary cases of dismissal of women workers by reason of marriage, pregnancy, childbirth, etc., which is prohibited under the Act, the women workers concerned must prove that they have been dismissed by the employer and that their dismissal has been done by reason that they have become pregnant, delivered a child or requested or taken a maternity leave before or after childbirth (see Article 9, paragraph [3]). On the other hand, in the case of dismissal of women workers who are pregnant or in the first year after childbirth, such dismissal is "void" in operation of law unless the employer successfully proves any justifiable grounds for dismissal other than pregnancy, childbirth, etc. Such provisions cannot be found in any labor laws other than the Equal Employment Opportunity Act, and deserve attention as the first legislation achieved for mitigating the burden of proof of women workers who have been dismissed during said period.

III. Issues That Remain to Be Addressed

The above is the overview of the history of the Equal Employment Opportunity Act that has passed the quarter-century milestone. The section below presents the issues with this Act that remain to be addressed in the future.

1. Re-consideration of the Concept of Discrimination

While the laws to prohibit gender discrimination in common-law jurisdictions generally include "discrimination by reason of the marital status" in the concept of gender discrimination, Japan's Equal Employment Opportunity Act only prohibits employers from requiring women workers to leave their jobs by reason of marriage (Article 9, paragraph [1]) and from dismissing women workers by reason of marriage (paragraph [2] of said Article), and does not incorporate the concept of "discrimination by reason of the marital status" from the beginning. It should be recalled that this is one of the obstacles to the prevention of

discrimination against women by reason that they have duties at home.

Discrimination against married women was brought to court in the Sumitomo Life Insurance Company Case (the judgment of the Osaka District Court, June 27, 2001, 809 *Rodo Hanrei* 5) and the Maruko Keihoki Case (the judgment of the Ueda Branch of the Nagano District Court, March 15, 1996, 690 *Rodo Hanrei* 32). In the former case, the company was alleged to have given low evaluation to all married women without exception and barred their promotion on the grounds that married women's labor would decrease in quality and quantity as most of them take a maternity leave before or after childbirth, child care leave, annual paid leave, etc., and that their duties at home constrain their engagement in work. The court found such uniform treatment of married women to be illegal and determined that it is impermissible to treat women workers in general as having failed to improve their capabilities only on the basis of their absence from work through the exercise of their rights under the Labor Standards Act. In the latter case, the court judged that the company's recruitment policy of assigning all unmarried women to full-time and regular position and all married women to full-time but non-regular position does not constitute discrimination against married women.

Thus, Japan's anti-discrimination law does not recognize the marital status as the subject of gender discrimination, and as mentioned above, the Equal Employment Opportunity Act, currently effective, prohibits "dismissal by reason of marriage" but does not prohibit discrimination by reason of the marital status. Seeing that there is still a view in Japan that the husband is the primary breadwinner of the family and the wife is supposed to work only to make up for a shortage in the family income, the marital status must also be incorporated into the Act as the subject of prohibition of discrimination.

2. Use of Positive Action

In order to eliminate gender discrimination in the employment field, the legal provisions to prohibit discrimination alone are not enough, but it may be vital to use positive action (positive measures to be taken by employers to eliminate discrimination) as well, because this can be an essential means to eliminate gender discrimination when it is difficult for the victim to bring the issue to court due to time and financial constraints, and it is also a necessary scheme to compensate for the discriminatory state that has existed for a long time.

The Equal Employment Opportunity Act leaves it to employers to implement positive action measures at their discretion ("shall not preclude employees from taking measures"). In 2010, when the aforementioned survey was conducted, the percentage of firms (with 30 or more employees; hereinafter the same) that implemented positive action measures was only 28.1%, showing that the overwhelming majority did not implement such measures. Among the latter category, 0.9% had previously implemented but discontinued positive action measures and 60.4% did not plan to implement such measures at the present time,

while only 10.6% were planning to implement the measures in the future.[8] This data indicates that the incorporation of the concept of positive action into the Act has had little effect so far.

The positive action measures that were frequently implemented are as follows (multiple answers allowed): (i) clarifying the criteria for employees' performance evaluation (67.3%); (ii) providing education/training for part-time employees or promoting them to regular employment (56.9%); (iii) improving the environment and culture at the workplace (46.2%); (iv) introducing a personnel management system or performance evaluation system under which taking a leave for childbirth or childrearing will not be a handicap for women workers (44.4%); (v) proactively recruiting motivated and talented women for a workplace where there is no or only a few women workers (41.5%); and (vi) developing a pleasant working environment (40.2%). On the other hand, the following measures were not frequently implemented: (i) working out a plan for enabling women to exert their abilities (17.3%); (ii) proactively providing women workers with education/training so they may be appointed for the positions and titles where there is no or only a few women workers (22.0%); (iii) conducting research and analysis on how women workers exert their abilities and problems they are facing when exerting their abilities (23.4%); and (iv) reviewing the criteria for recruitment, assignment and promotion that are difficult for women workers to comply with (28.9%).[9]

The realities shown above clearly indicate the necessity to further promote positive action measures, and also in light of the fact that essential measures for positive action were not implemented, which measures are actually needed to ensure effective positive action should be presented more clearly.

3. Private Law Remedies for Discrimination in Recruitment

In the context of interpretation of the current Equal Employment Opportunity Act, a question arises as to how private law sanctions against contravention of this Act should be considered, and this question is especially important in relation to discrimination in recruitment and promotion.

As for discrimination in recruitment, the recruitment criteria adopted by most Japanese firms are non-transparent and their details cannot be identified from outside. Therefore, it is extremely difficult for rejected job applicants to prove that the rejection was derived from discrimination by reason of sex, and even if they successfully prove this, it is generally considered that the remedies to be awarded to them by the court according to the principle of employer's freedom in recruiting employees would be compensation for damage only as a token, and it would be difficult to compel recruitment of those rejected.[10]

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[8] 21st Century Job Foundation, *supra* note 1, 205.

[9] 21st Century Job Foundation, *supra* note 1, 206.

[10]   There is an argument that gender discrimination in recruitment should rather be dealt with as an issue of positive action. See Mutsuko Asakura, *Rodoho to Jenda* [Labor law and gender] (Yuhikaku, 2000), 148.

The judgment of the Grand Bench of the Supreme Court in the Mitsubishi Plastics Case (December 12, 1973, 27 *Saikosai Minji Saibanreishu* 1536) is a famous precedent judgment that emphasized the concept of freedom of recruitment. In this case, the absence of any law or regulation to govern recruitment practice at that time was mentioned as one of the grounds for upholding the company's claim of freedom of recruitment. However, although there was no law or regulation to govern recruitment practice when this judgment was rendered in 1973, it should be called to mind that we now have laws and regulations to restrict freedom of recruitment against discrimination by reason of sex (Article 5 of the Equal Employment Opportunity Act), age (Article 10 of the Employment Countermeasures Act) or disabilities (Article 44 of the Act on Employment Promotion etc. of Persons with Disabilities). In this respect, freedom of recruitment may no longer be perfectly inviolable.

4. Sexual Harassment and Employers' Obligation to Give Consideration

As remedies for sexual harassment, a theory of obligating employers to give consideration to the working environment has come on the scene. In the sexual harassment case in Fukuoka (the judgment of the Fukuoka District Court, April 16, 1992, 607 *Rodo Hanrei* 6), the court stated that an employer has the obligation to give consideration to the working environment "so as not to violate employees' personal dignity in relation to provision of labor or seriously interfere with their engagement in providing labor." In the sexual harassment case in Sendai (the judgment of the Sendai District Court, March 26, 2001, 808 *Rodo Hanrei* 13), the court acknowledged that the employer (an automobile dealership in this case) has the obligation to improve the working environment, or more specifically, the "obligation to improve the facilities so that employees can engage in work in a favorable working environment," and also has the obligation to give consideration to the working environment, that is, the "obligation to give consideration to maintaining and securing a favorable working environment for employees' engagement in providing labor," and that these obligations are covered by an employment contract.

A question arises in respect of the relationship between employees' obligation to take measures to prevent sexual harassment prescribed in the Equal Employment Opportunity Act (Article 11), and their obligation to give consideration to the working environment mentioned in the court rulings. Specifically, the Sexual Harassment Guidelines, established under the Act, designate (i) clarification of policy, (ii) development of a consultation system, and (iii) implementation of appropriate measures ex post facto, as employers' obligations. Then, if employers fulfill these obligations, are they deemed to fulfill the obligation to give consideration to the working environment as well?

There is an argument that employers may be exempt from liability for tort or default as long as they fulfill the obligations prescribed in the Sexual Harassment Guidelines. However, the list of obligations under these guidelines provides for the minimum standards that employers must meet, which means that employers may not always be exempted from liability for default even when they fulfill those obligations.

Long-Term Impacts of the Equal Employment Opportunity Act in Japan*

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In this paper, I survey the literature on the impact of the Equal Employment Opportunity Act (EEOA) on labor market outcomes of women in Japan. The findings are as follows. First, after the enactment of the EEOA, regular full-time employment rose among highly educated women younger than age 40. Second, examined separately by marital status, regular full-time employment did not increase for either married or single women, compared with their predecessors. These patterns reflect the fact that the marriage rates of highly educated women fell after passage of the EEOA. Third, the female-to-male wage ratio and the ratio of average tenure of female workers to that of male workers improved, mainly for less-educated women over age 40, but not for highly educated young women. Finally, there are regional differences in the increases in regular employment of highly educated women: namely, it increased significantly in Tokyo.

I. Introduction

More than a quarter of a century has passed since the adoption of the Equal Employment Opportunity Act (EEOA) in Japan. Given the recent interest in women's status and their participation in the labor market in Japan (e.g., Hausmann, Tyson, and Zahidi 2012; Steinberg and Nakane 2012), it is worthwhile to evaluate what this law has (and has not) achieved over the last 25 years. It is likely that the EEOA has changed many dimensions of economic lives in Japan. For example, the term "post-EEOA cohorts" refers to the cohorts that graduated from school and entered the labor market after the enactment of the law.[1] Their experiences in work and life are thought to differ from those of their predecessors. In this paper, I assess the extent to which the law has changed the nature of work among women in Japan by summarizing findings from recent empirical studies. The aspects I focus on are as follows: (1) participation in the labor market, in regular full-time employment, and in non-regular employment; (2) wages; (3) tenure; and (4) geographical features in participation.

The most important finding is that, the EEOA did not increase regular employment either for highly educated married women or single women, compared with their predeces-

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[1] The importance of considering cohort in understanding female participation or gender wage convergence is pointed out in the literature (e.g., Goldin 1990; O'Neill and Polachek 1993).

sors. The marriage rates of highly educated women fell after the EEOA, which contributed to the increase in regular employment among highly educated women younger than age 40, but the increase was small for those over age 40. The EEOA did not contribute to an increase in the number of women who achieve family and career. The most common obstacles to pursuing family and career are the high costs and/or availability of childcare and commuting costs.

II. Overview of the EEOA[2]

The EEOA passed the Parliament in 1985 and was enacted in 1986. Major revisions of the EEOA took place in 1999 and 2007. In the EEOA of 1986, discrimination against women was not prohibited; rather, the law stipulated that employers needed to make an effort not to discriminate against women in hiring, task assignment, and promotion. In the 1999 revision, discrimination against women was prohibited, and the maternity protection for pregnant employees became mandatory.[3] In the 2007 revision, discrimination against both sexes (not just women) was prohibited. Positive action was first stipulated in the 1999 revision, and remained legal after the 2007 revision.

The Childcare Leave Act was enacted in 1992, and expanded to cover long-term care leave in 1999. Several revisions have been made since 1992. However, it is generally understood that the Childcare Leave Act did not increase continuous employment of mothers. More specifically, although the number of mothers who take childcare leave has increased, the number of mothers who continued employment without taking leave decreased; therefore, the total number of new mothers who continued their employment around childbirth increased only slightly (National Institute of Population and Social Security Research 2004).[4]

To summarize, the legal system now encourages women's employment, both by promoting equality and by facilitating continuous employment for new mothers. As the statistics in the following sections show, however, employment in regular full-time jobs has not increased much for married women after passage of the EEOA.

III. Effects of the EEOA

1.   Identifying the Effects of the EEOA
A natural way to evaluate the EEOA's impact would be to measure the differences in labor market outcomes before and after its passage. However, this comparison does not necessarily extract the causal impact of the law, if other changes took place at the same time

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[2] For a detailed explanation of EEOA, see Yamada (2013) in this issue.
[3] Mandate for maternity protection took effect in 1998.
[4] However, there are differences between regular full-time employment and other employment; see Cabinet Office (2012).

the law took effect. In fact, the labor market in Japan went through many changes during the time the EEOA was enacted and enhanced, including a greater degree of globalization, increases in the service sector and in non-regular employment, as well as recessions from the late 1990s to early 2000s. In general, disentangling the EEOA's effects from the impacts of other changes is not a straightforward process.

Transformations in the labor market that are important for understanding the EEOA's impact are the recession in the late 1990s (Heisei recession) and the increase in non-regular employment. As is well known, the recession in the late 1990s decreased the regular full-time employment of the young. Men and women who finished schooling and entered the labor market during the recession period have had difficulties obtaining full-time positions later in life, even during times of economic recovery (Genda, Kondo, and Ohta 2010). Examined separately by education, however, university graduate women gained regular employment more than their male counterparts even in the Heisei recession period, whereas for less-educated groups, females lost regular employment to a similar extent as males (Abe 2010).

Another important change was the increase in non-regular employment, which began with the higher participation by middle-aged married women in part-time employment. In the Heisei recession period, non-regular employment became more prevalent among young workers. Traditionally, the typical non-regular workforce consisted of part-time workers and casual workers.[5] After 1997, the number of new types of non-regular workers, such as temporary staffers or contract workers, increased (Kambayashi and Kato 2011; Abe 2012). The EEOA's impact on non-regular employment is likely to be limited, because the majority of traditional-type, non-regular employees (part-time and casual employees) were women; therefore, the equal treatment of men and women is a minor issue.

2. Participation

In this subsection, I review how the EEOA affected women's participation in the labor market, mainly based on Abe (2011a).[6]

The conclusions of Abe (2011a) are summarized as follows. First, the EEOA increased regular employment of university graduate women younger than 40. For the less-educated group, regular employment has not increased compared to that of their predecessors. Furthermore, even for university graduate women, the increase in regular employment in the early 40s was small. In other words, when the earliest post-EEOA cohorts reached age 40 or over, the increase in the proportion of regular employment in population was not much greater than it was among earlier cohorts of university graduate women. At the same time, non-regular employment (especially part-time employment) has increased among women over time, independent of the EEOA; part-time employment increased even before the EEOA, and this trend continued thereafter.

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[5] Casual workers are called "arbeit workers" in Japan.
[6] The statistics shown below cover a longer time period than those shown in Abe (2011a)

Second, women of post-EEOA cohorts marry later, or a higher proportion remain unmarried, than their pre-EEOA counterparts. Furthermore, examined separately by marital status, participation in regular full-time employment has not increased since passage of the EEOA.

In what follows, I use microdata of the Employment Status Survey (ESS) from 1982 to 2007 to show the cohort profiles of participation by women. By using repeated cross sectional data, I trace the average experience of women of each cohort over a 25-year period. Cohort is defined by the combination of the 5-year intervals in the birth year and educational attainment. Three levels of education are used: (1) junior high school graduates, (2) senior high school graduates, and (3) university graduates or over. For participation, three measures are used: (1) the regular employment ratio; (2) the part-time employment ratio; and (3) the non-traditional, non-regular employment ratio. These are defined as follows:

$$(1) \qquad RER = \frac{\text{Number of Regular Employees}}{\text{Population}},$$

$$(2) \qquad PTER = \frac{\text{Number of Part-time Employees}}{\text{Population}},$$

$$(3) \qquad NTNR = \frac{\text{Number of non-traditional non-regular Employees}}{\text{Population}},$$

where "Number of Regular Employees" is the sum of regular employees and executives and "Population" is the population for each cell defined by birth year, education, and age group.[7, 8]

Figure 1 plots the three measures for each cohort, against age. Three patterns emerge. First, post-EEOA cohorts of university graduates consistently experienced increases in regular employment, but those with less education did not experience similar increases. Even for university graduates, the increase was limited to ages younger than 40. Senior high school graduate women of early post-EEOA cohorts had high regular employment ratios, but later cohorts had a low level of regular employment. Second, for part-time employment, participation has significantly increased as each cohort has aged. There also was a discernible inter-cohort increase in participation in part-time employment by less-educated women; that is, later cohorts of less educated women are more likely to work part time, compared

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[7] Part-time workers in the numerator of Eq. (2) include both part-timers and casual (arbeit) workers in the ESS. Part-time workers in the ESS correspond to those who are called part-timers in the workplace. Therefore, they include non-regular employees whose working hours are relatively long.

[8] In this paper, regular employment is defined by the worker title at the workplace, instead of working hours.

A. Regular employment
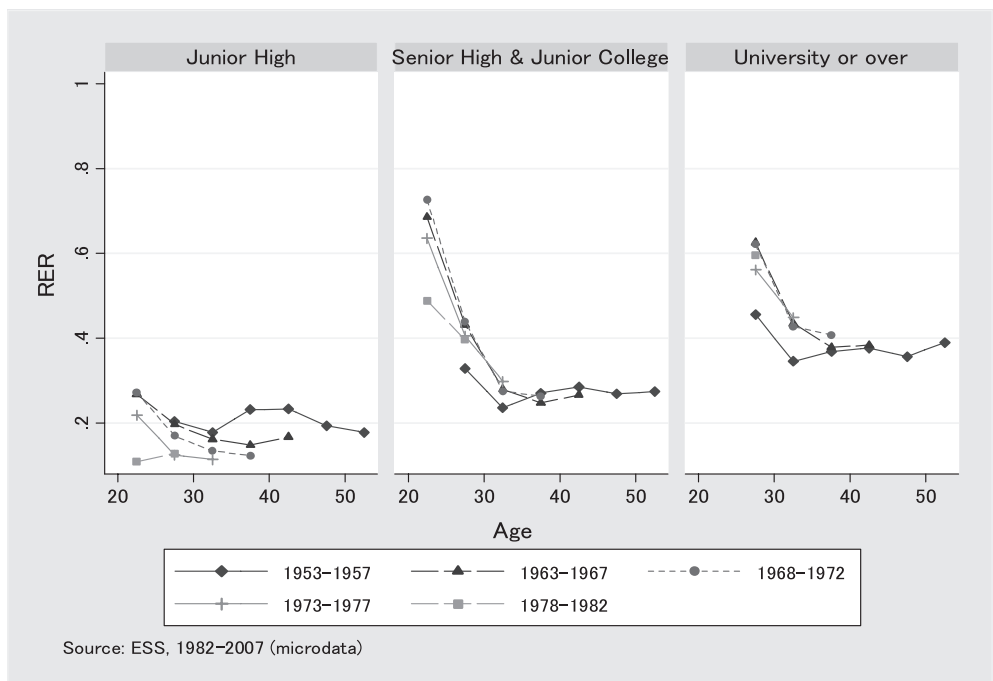
B. Part-time and arbeit employment
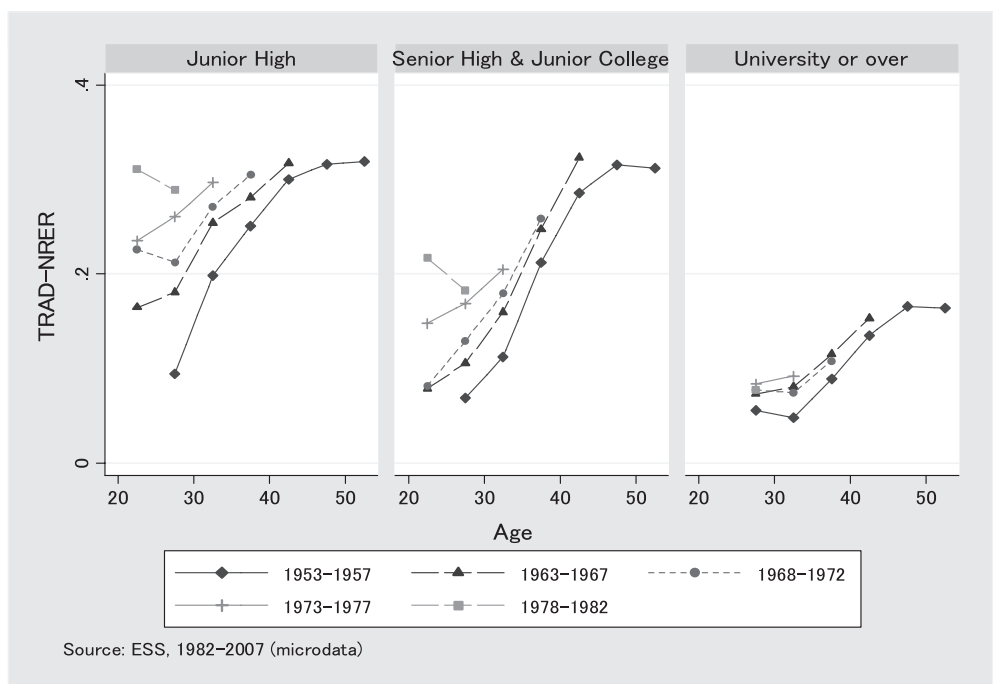
C. Non-traditional non-regular employment
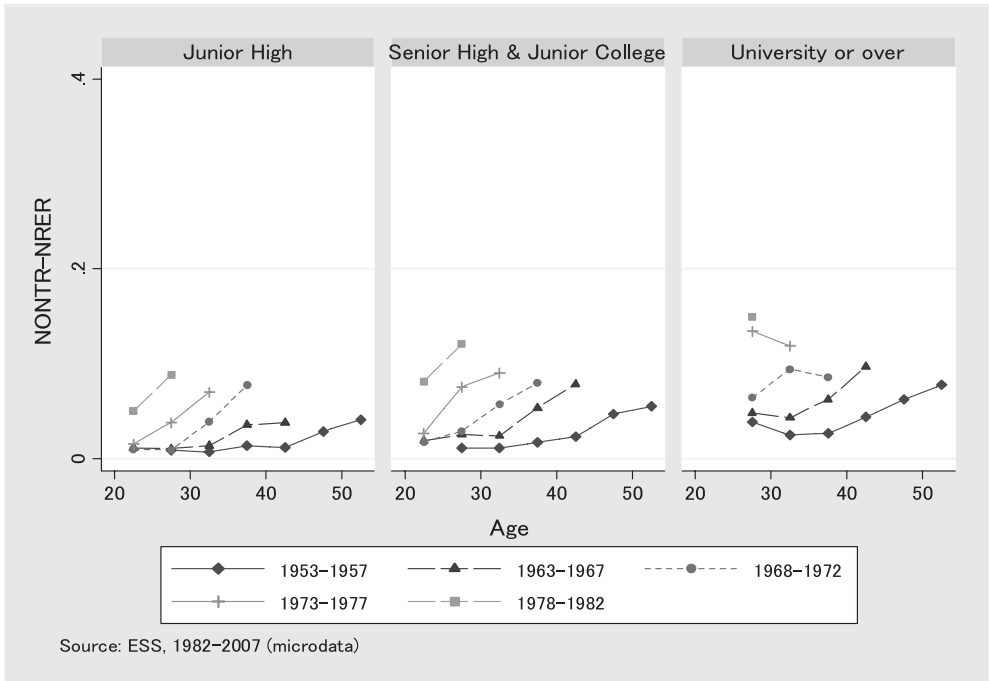
Source: Author's calculation from the ESS (1982–2007).

Figure 1. Participation by Cohort

with their earlier counterparts. In panel C, the ratio of non-traditional non-regular employment is plotted. This type of employment increased for all education groups over time. It increased with age for fixed cohorts, but it also increased for recent cohorts, compared with earlier cohorts.

In Figure 2, the regular and non-regular employment ratios are plotted against age by education and marital status. For both married and non-married groups, the regular employment ratio did not increase for post-EEOA cohorts from pre-EEOA cohorts. In other words, post-EEOA cohorts had levels of regular employment similar to those of their pre-EEOA counterparts, implying that the EEOA has not advanced regular employment of married women.

A. Senior high school or junior college graduates, regular employment
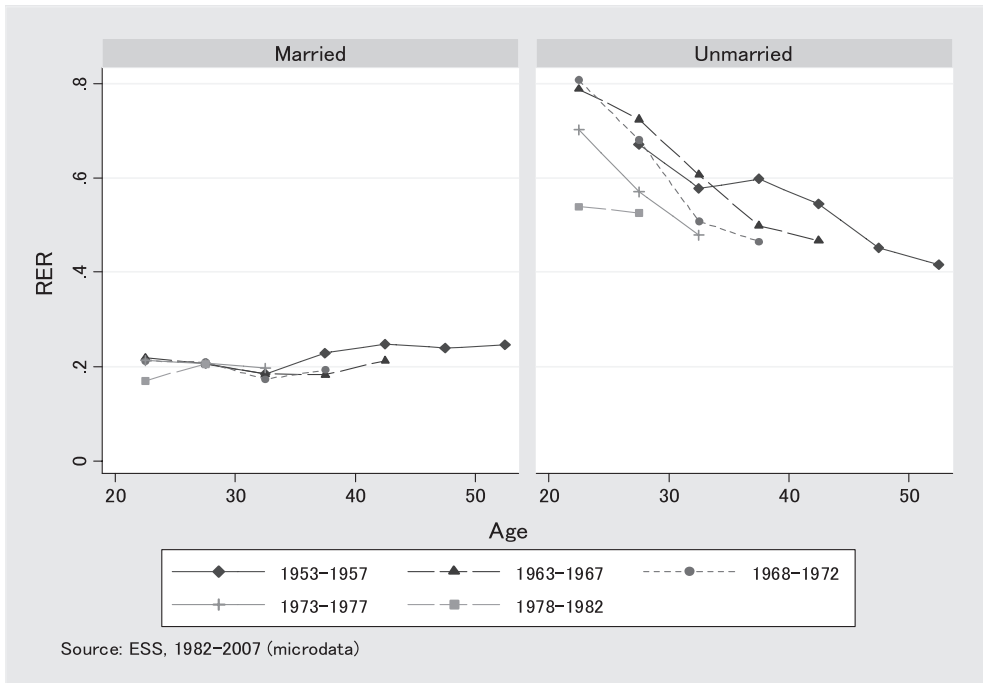
B. Senior high school or junior college graduates, non-regular employment
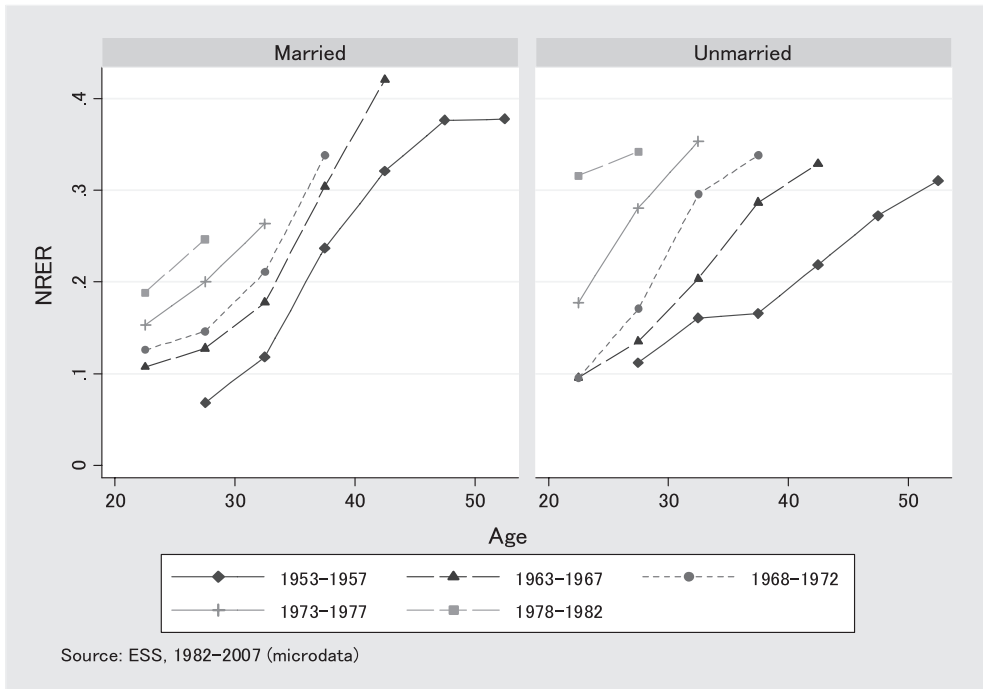
C. University or over, regular employment

Source: ESS, 1982–2007 (microdata)
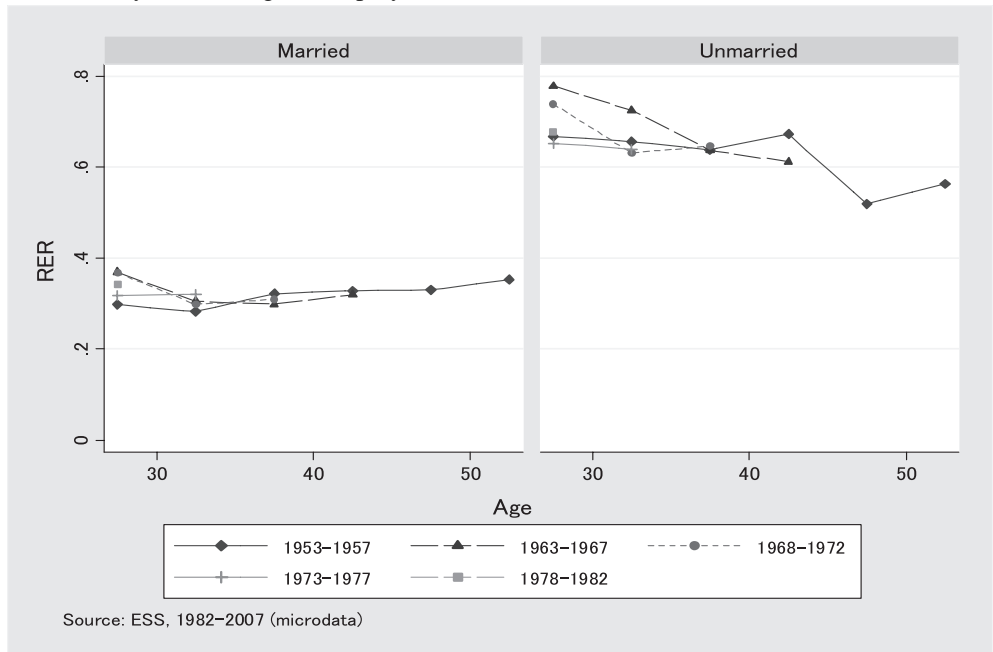
D. University or over, non-regular employment

Source: ESS, 1982–2007 (microdata)
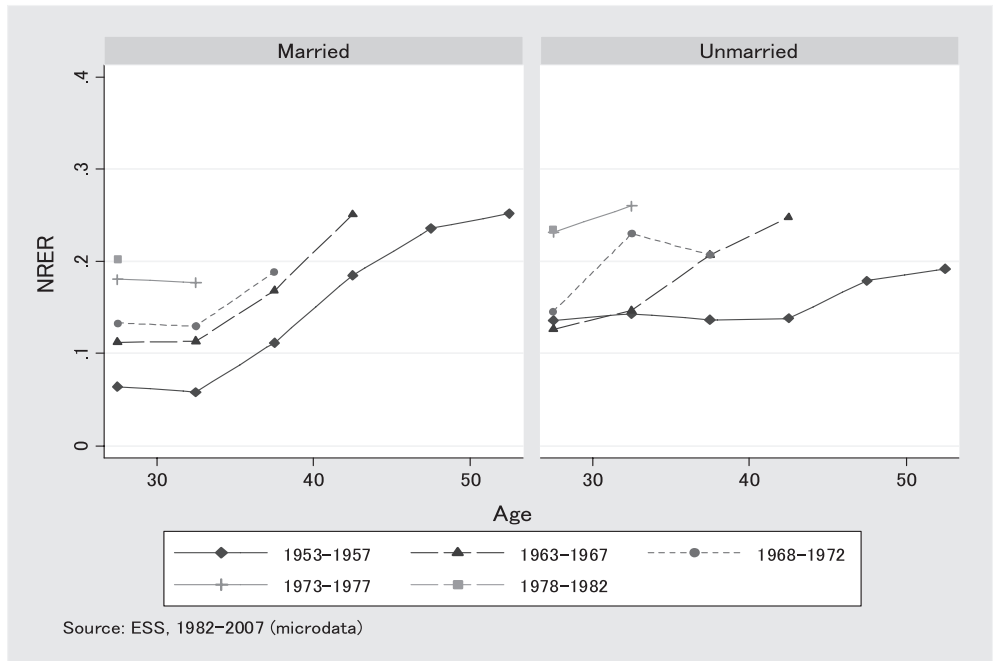
Source: Author's calculation from the ESS (1982–2007).

Figure 2. Participation by Cohort, by Marital Status

3. Gender Wage Gap

How did the gender wage gap evolve after the EEOA? Wages are observed only for workers, but whether a woman works or not (participation) is endogenous; therefore, it is possible that the gender wage gap is affected by level of participation.[9] It is reported in the literature that the gender wage gap is greater in countries with high participation rates (Olivetti and Petrongolo 2008; see also Hunt 2002).

Hori (1998) and Kawaguchi (2005) apply Juhn, Murphy, and Pierce's (1991) procedure to decompose the wage gap into three components: (1) observed explanatory variables, (2) observed prices, and (3) unexplained differentials. Hori uses data of the Basic Survey of Wage Structure (BSWS) from 1986 and 1994 and concludes that the unexplained gap is the major cause of the narrowing gender wage gap between these two years. Kawaguchi (2005) uses the BSWS data from 1990 and 2000, and arrives at a different conclusion: he reports that the extension of tenure by female workers was the major cause of the narrowing gender wage gap, but the effect of tenure was small for university graduates. In other words, the extension of tenure occurred for less-educated female workers and resulted in the narrowing gender wage gap.

Abe (2010) analyzes aggregate data of the BSWS from 1975 to 2005 to examine the gender wage gap over this period. Over the cohorts, the gender wage gap narrowed significantly: later cohorts of women received a higher relative wage compared to their male counterparts. Figure 3 plots the relative wage for pooled education groups (Panel A) and separately for two education groups (senior high school graduates and university graduates or over, Panel B). As the figure shows, the improvement in relative pay took place for the less educated and not for the highly educated.

Since Hori (1998) and Kawaguchi (2005) arrive at somewhat different conclusions, future research should reconcile these findings and pursue the causes of long-term changes in the gender wage gap, preferably using data that span a long time period.

4. Tenure

Another dimension in which the EEOA may have had an impact is the tenure (length of service at the employer) of female workers. Kawaguchi (2005) argues that, although the average tenure of female workers grew from 1990 to 2000, its impact on the gender wage gap was limited for university graduates. In Figure 4, I use aggregate data of the BSWS from 1975 to 2010 to show the ratio of the average tenure of female workers to that of male workers. The higher the ratio, the longer the average tenure of women, relative to that of men. Since tenure is shorter for women than for men for older workers, this ratio takes values less than 1 for older age groups. Figure 4 shows that the tenure of less educated women was extended, whereas that of university graduates was not. University graduate women of post-EEOA cohorts gained in terms of regular employment, though their relative

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[9] Onozuka (2013) is a recent study for Japan.

A. All education groups
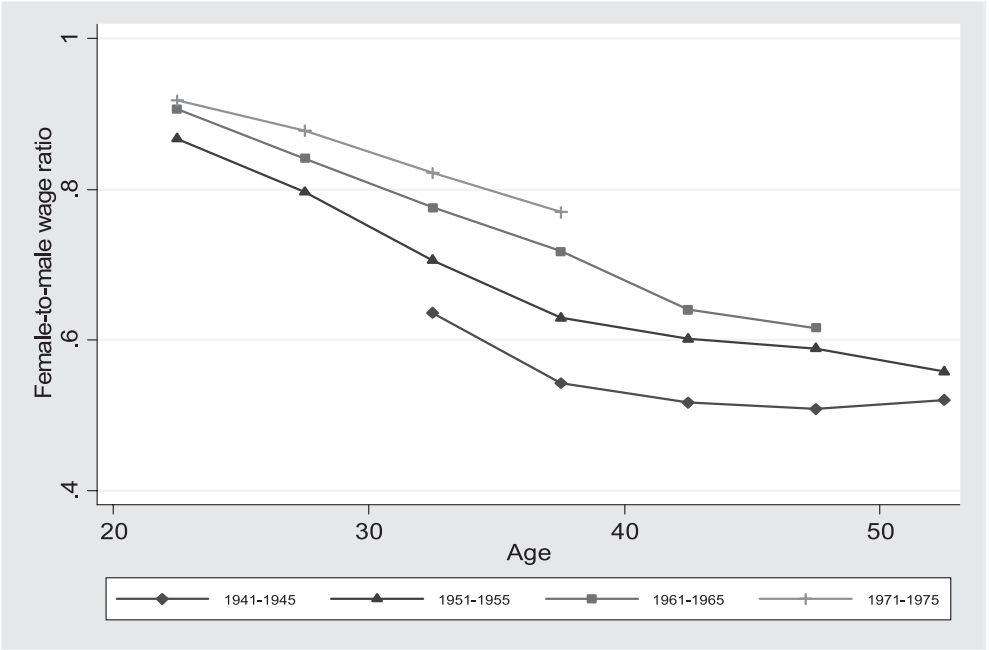
B. By education
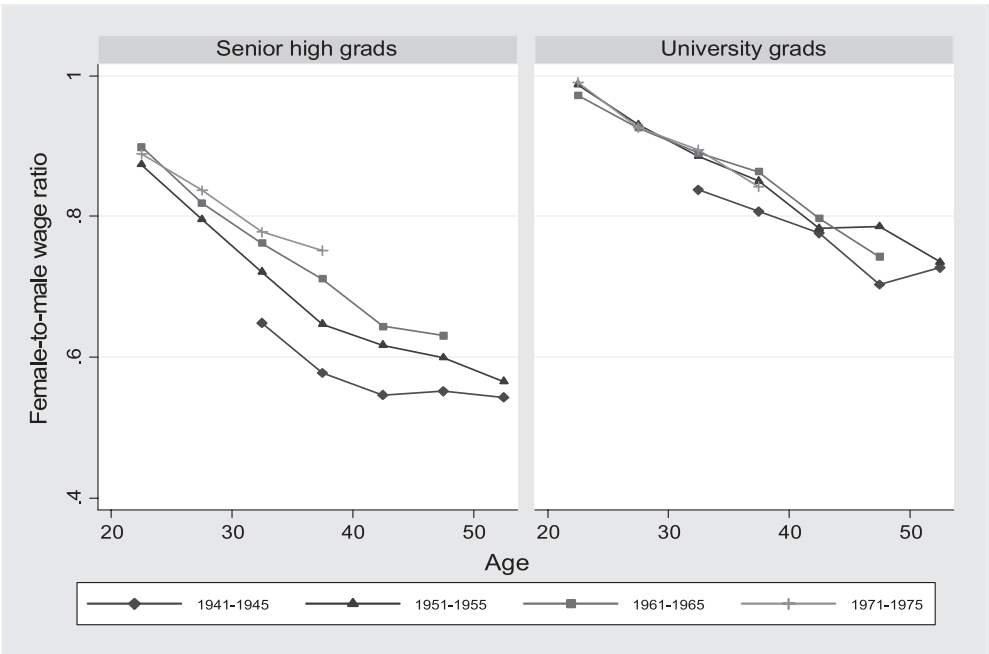
Source: Authors' calculation from the BSWS (1975–2010).

Figure 3. Female-to-Male Wage Ratio, by Cohort
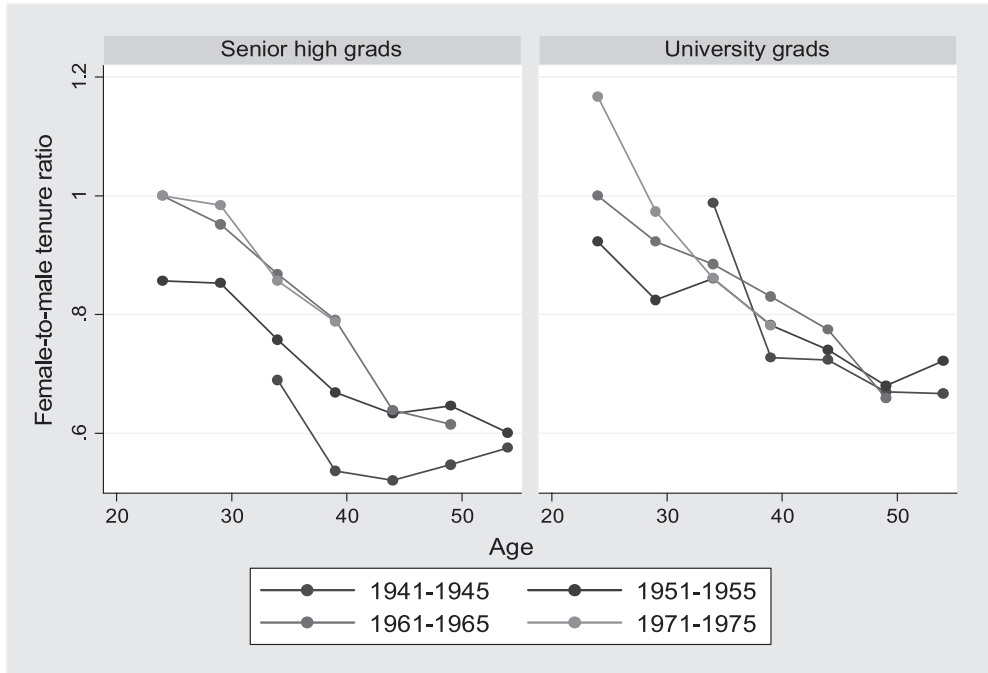
Source: Authors' calculation from the BSWS (1975–2010).

Figure 4. Female-to-Male Tenure Ratio

wages or tenure did not advance much compared to their male counterparts. On the other hand, there has been a gain in relative wages and average tenure of less-educated female workers.

Two studies have examined the EEOA's impact on educational choice. If the EEOA opened up the labor market opportunities for highly educated women, then women who decide their educational investment after the law's enactment would be likely to choose a higher level of education, other things being equal. Edwards and Pasquale (2003) and Edwards and Sakai (2011) investigate this channel using the data from the Japan Panel Study of Consumers. Edwards and Sakai (2011) conclude that women who chose their educational investment after the EEOA were more likely to advance to four-year universities, and the likelihood that they would marry before age 30 decreased.

5. Residential Decisions and the EEOA

The statistics reported so far are the aggregate of all regions in Japan. Abe (2011c), on the other hand, investigates the possibility that the impacts of EEOA differ across regions. The factor that motivates regional analysis is that women's participation rates differ significantly across Japan's regions: in particular, the northern coastal region of Honshu

Island (Yamagata, Niigata, Toyama, Ishikawa, Fukui, Tottori, and Shimane prefectures) has much higher participation rates than any other region in Japan (Abe 2013).[10] For younger cohorts, however, the pattern of regional disparities has been changing: in 2007, for those aged 40 years or younger, the employment-population ratio in Tokyo was at a comparable level to that of the northern coastal region.

The three main conclusions from Abe (2011c) are as follows. First, the way in which women's participation changed after passage of the EEOA differs across regions. As shown in Section 3.2, regular employment of university graduate women increased for ages younger than 40 (Figure 1. A) for all of Japan. In terms of region, the regular employment ratio of highly educated young women increased in Tokyo, but to a lesser extent in non-metropolitan areas. Second, as shown in Figure 2. C, while married women's regular employment ratio did not increase for Japan as a whole, it increased significantly in Tokyo. In sum, after enactment of the EEOA, regular employment of highly educated women increased most in Tokyo, perhaps because employment in Tokyo is more likely to be affected by the EEOA than employment in other regions. For instance, the occupational composition in Tokyo and elsewhere may be different: employment as teachers or public officers exists both in Tokyo and elsewhere, but service sector or managerial jobs are more abundant in Tokyo than elsewhere. The EEOA's impact may be small for teachers and public officers, resulting in a smaller impact outside of Tokyo.

To summarize, the impact of the EEOA was not uniform across several dimensions. In terms of employment, post-EEOA cohorts of highly educated women increased their participation in regular full-time employment at ages younger than 40. Therefore, the EEOA has promoted the equality of men and women in the workplace for the highly educated young. On the other hand, this development has not resulted in an increase in relative pay for the group of female workers who gained in terms of regular employment (e.g., young university graduates). Rather, less-educated older women gained in wages, relative to their male counterparts. Examined separately by marital status, regular employment of women did not increase either for married or single women. After the EEOA, more women married late or chose not to marry, resulting in higher regular employment at young ages.

Women's labor market participation increased in many developed countries. In the United States, for instance, the most significant change has been that participation by married women with young children increased (Blau and Kahn 2007). The experience of women in Japan has been quite different. First, the increase in women's employment in Japan was due to an increase in part-time work by middle-aged married women and an increase in regular employment by young, unmarried women. Therefore, the EEOA did not increase the number of women who achieve both family and career. This does not necessarily mean that the EEOA did not improve the status of women in the workplace. Even though the

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[10] Regional variations in women's participation attract attention in other countries. For example, Black, Kolesnikova, and Taylor (2013) report evidence from US cities.

numbers did not increase, progress may have been made in other dimensions. For example, it is possible that women of post-EEOA cohorts are more likely to be promoted to managerial positions than their pre-EEOA counterparts. In addition, even though the proportion of women who continued their employment after childbirth did not increase significantly, women of later cohorts who did continue to work may have advanced further in their career than did their predecessors.

The possible reasons why the EEOA has not been successful in promoting women's employment are the limited availability of childcare and high commuting costs. Childcare is limited and rationed in large metropolitan areas, making it difficult for mothers to continue employment. Commuting costs and high housing prices in large metropolitan areas, especially in Tokyo, are also obstacles to women's employment in regular full-time jobs; these employment opportunities are located in the Central Business District, to which a lengthy commute is required (Abe 2011b). Legal measures, such as the EEOA or Childcare Leave Act, do not immediately reduce the cost of childcare, housing, or commuting. The main obstacles to the further advancement of women's career and family are in areas outside of legal measures.

IV. Conclusion

In this article, I survey recent literature on the impact of the EEOA in Japan. The findings are summarized as follows. First, regular employment among highly educated women younger than age 40 rose after enactment of the EEOA. Second, regular employment did not increase for either married or single women, compared with their predecessors. Third, the female-to-male wage ratio and the ratio of average tenure of female workers to that of male workers improved, mainly for less-educated women over age 40 and not for highly educated young women. Finally, regular employment of highly educated young women increased more significantly in Tokyo than elsewhere. The EEOA did not increase the number of women who achieve family and career. The obstacles for the further advancement of women's career and family are in areas outside of legal measures, such as costs of childcare and commuting.

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Equal Employment Opportunity Act and Work-Life Balance: Do Work-Family Balance Policies Contribute to Achieving Gender Equality?

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This paper has two objectives. One is to clarify the aims of the government's formulation of policies concerning work-life balance after the Equality Act entered into force and the intentions of companies in introducing systems relating to work-life balance; the other is to consider whether or not policies concerning work-life balance have had any effect on women's participation in the labor market, using both macro- and micro-level data to examine this question. As a result, the following has become clear. Firstly, the government's main measures to promote a better work-life balance were implemented as measures to counter the declining birthrate. The vast majority of companies provide support for achieving compatibility between work and child rearing as part of their efforts to make a contribution to society. However, around two-thirds of companies have implemented measures to support achieving compatibility between work and family with the expectation that this will improve the motivation of female workers and increase their retention within the company. Secondly, over the last 20 years, the female attrition rate due to marriage has declined considerably and the level of female retention, as seen in terms of the proportion of women among long-standing staff members, has increased. At the same time, women's relative wage has also risen. Moreover, since 2000, the employment rate among women with preschool-age children has risen, as has the proportion of female managers. However, the rise in the relative wage of women is very sluggish. Thirdly, comparing individual companies, the more assiduous the senior management at a company is about measures to promote a better work-life balance, the higher the level of female retention, and the higher the level of female retention, the more successful women are in a company.

I.   Introduction

This year it will be 27 years since the Equal Employment Opportunity Act entered into force, but the gender gap in economic activities in Japan is still one of the biggest among all developed countries. One of the root causes of this is the division of labor by gender. The fact that women bear the majority of the burden of housework and child rearing hinders their active participation in the labor market in the same way as men. Many women quit their jobs because of marriage, childbirth or child rearing, and even women who continue in employment find it hard to work in the same way as men, because of the burden of housework and childcare.

The Equality Act alone is insufficient in order to break through this situation. The objective of the Equality Act is, as the name suggests, to achieve equality of opportunity, or, to

put it another way, to remove discriminatory treatment; it does not require employers to implement any initiatives beyond this. Consequently, it has no provisions to encourage employers to support efforts to achieve compatibility between work and family life. However, if it is difficult to achieve compatibility between work and family life, it will be impossible for most women to work in the same way as men, so a gender gap will remain.

Nevertheless, it is not possible for the government forcibly to change the division of labor within individual households. One thing that can be done in terms of policy is to develop systems that enable women to work while doing housework and bringing up children, and another is to develop systems that enable men to participate more in housework and childcare. Shortening working hours and making them more flexible (that is to say, more flexible in a way that reflects the requests of workers rather than their companies) is a policy that achieves both of these things, while the enhancement of childcare services and the child care leave system are policies that reflect the former rather than the latter goal.

Creating a society that makes it possible to achieve compatibility between work and family life in this way is one of the objectives of work-life balance (hereinafter abbreviated to WLB) policy. The term WLB spread across the globe after the WLB campaign initiated in 2000 by British Prime Minister Tony Blair. In Japan, the Work-Life Balance Charter was formulated in 2007 and it would be fair to say that, today, the government, companies and labor unions are all aware of its importance.

The L (life) in WLB includes not only family life, but also all parts of people's lives outside work, such as personal development, volunteer activities, hobbies and activities undertaken for the sake of one's health. However, in relation to more active participation by women, it is important to achieve compatibility between work and family life, particularly housework and child rearing, so this paper focuses on the achievement of compatibility between work and family life. It does not discuss matters relating to achieving compatibility with activities other than family life, such as personal development, volunteer activities, hobbies and activities undertaken for the sake of one's health.

This paper has two objectives. One is to clarify the aims of the government's formulation of policies concerning WLB after the Equality Act entered into force and the intentions of companies in introducing systems relating to WLB; the other is to consider whether or not policies concerning WLB have had any effect on women's participation in the labor market, using both macro- and micro-level data to examine this question.[1]

The structure of this paper is as follows. Section II discusses the process of introducing

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[1] Studies that have analyzed the impact of the child care leave system on continuing female employment include Higuchi (1994), Tomita (1994), Morita and Kaneko (1998), Waldfogel, Higuchi and Abe (1999), and Suruga and Zhang (2003); these studies conclude that the child care leave system has a tendency to increase the probability of women continuing in employment. Moreover, Matsushige and Takeuchi (2008) asserts that measures to support achieving compatibility between work and family will extend the number of years of continuous service by women and that the proportion of female managers and women's wages will increase as a result.

Table 1. WLB-Related Policies since the Equal Employment
Opportunity Act Entered into Force

1987	Labor Standards Act revised (40-hour working week introduced)
1991	Childcare Leave Act enacted
1994	Angel Plan formulated
1995	Childcare Leave Act revised, becomes the Child Care and Family Care Leave Act
1999	New Angel Plan formulated
	Family-Friendly Companies Awards begin
2000	Nursing care insurance system enters into force
2003	Act on Advancement of Measures to Support Raising Next-Generation Children enacted
	Basic Act for Measures to Cope with Society with Declining Birthrate enacted
2007	Work-Life Balance Charter issued

WLB-related policies after the entry into force of the Equality Act, with a particular focus on the objectives of those policies. Section III uses statistics to discuss the degree to which the level of female retention in the labor market and gender equality have improved between the time the Equality Act entered into force and today. Section IV uses individual data from surveys of companies to analyze the relationship between companies' systems to support achieving compatibility between work and family and women's success within those companies. Finally, Section V summarizes the discussion.

II. WLB-Related Policies since the Equality Act Entered into Force

Table 1 summarizes the main WLB-related policies since the Equal Employment Opportunity Act entered into force. The first WLB-related policy on which we should focus is the 1987 revision of the Labor Standards Act. As a result of this, statutory working hours were reduced from 48 to 40 hours a week. However, the 40-hour working week was not applied to all companies immediately; rather, a transitional grace period was established for certain industries and scales of company. The 40-hour working week began to be applied to all companies in 1997. Following the end of the period of high economic growth, total actual working hours had stabilized at around 2,100 hours, but 1987, when the law was revised, marked the point after which they began to decline.

It cannot be denied that one of the factors contributing to this revision of the Labor Standards Act was the advance of women into the workplace as a result of the increasingly upgraded industrial structure, but a more direct cause was trade friction. At that time, Japan's trade surplus was expanding and there was intensifying criticism from the West that "Japanese people work too much." In order to deal with such criticism from overseas, the Nakasone Cabinet established the Advisory Group on Economic Structural Adjustment for International Harmony, which published its report (the Maekawa Report) in 1986. The

Maekawa Report highlighted the necessity of reforming the industrial structure, shifting from being dependent upon external demand to being led by domestic demand; one of the measures that it advocated to this end was the shortening of working hours in order to expand domestic demand (i.e. expand consumption). This was the motive force driving the introduction of the 40-hour working week.[2]

At the same time, most policies to support achieving compatibility between work and child rearing have been implemented as measures to counter the declining birthrate. The Childcare Leave Act was enacted in 1991, but the background to this was the long-term decline in the birthrate from the mid-1970s. In particular, in 1990, it emerged that the previous year's total fertility rate had reached the postwar record low of 1.57, so concern about the declining birthrate suddenly increased (the "1.57 Shock"). This provided a major impetus for the enactment of the Childcare Leave Act.

Subsequently, successive measures to counter the declining birthrate were launched, in the form of the Angel Plan (1994) and the New Angel Plan (1999). Moreover, laws such as the Act on Advancement of Measures to Support Raising Next-Generation Children (2003) and the Basic Act for Measures to Cope with Society with Declining Birthrate (2003) were enacted. The fundamental component of these measures to counter the declining birthrate is support for achieving compatibility between work and child rearing. In addition, at the heart of policies that support achieving compatibility between work and child rearing are the enhancement of public childcare services and the requirement for employers to implement measures to support achieving compatibility between work and family life.

As well as granting workers the right to leave until their child reaches the age of one year (or 18 months, under certain circumstances), the Child Care and Family Care Leave Act stipulates that while on leave, workers will receive half their wage as a Childcare Leave Benefit under the employment insurance system. Furthermore, it guarantees a short-time work system and an exemption from overtime work for workers with a child aged under three years, as well as guaranteeing workers with children who have not yet started elementary school the right to take sick/injured child care leave, in order to enable such workers to take care of their children if unwell.

Moreover, the Act on Advancement of Measures to Support Raising Next-Generation Children obliges employers with 101 or more employees to formulate measures to support achieving compatibility between work and child rearing (a general business owner action plan or an action plan for employers regarding countermeasures to support the development of the next generation), to notify the Equal Employment Office of the Labor Bureau of these measures, to make the details publicly available, and to ensure widespread awareness of these measures among employees. In addition, in the Guidelines for Formulating Action Plans, the Ministry of Health, Labour and Welfare requires that, as well as promoting im-

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[2] The author referred to Hamamura (2000) for the social background to the introduction of the 40-hour week.

provements in workplace awareness and the workplace culture, employers implement initiatives aimed at achieving improvements in numerical indicators, such as the proportion of those working long hours (60 or more hours a week), the annual paid leave take-up rate, and the child care leave take-up rate among both men and women (Ministry of Health, Labour and Welfare 2009).

As described above, the motive force driving the policy of the 40-hour working week prescribed under the revised Labor Standards Act was pressure from overseas resulting from trade friction, while that providing the impetus for policies to support achieving compatibility between work and child rearing was the sense of crisis about the declining birthrate; thus, achieving gender equality was not necessarily the main objective of these policies. Amid this situation, rather than being a measure to counter the declining birthrate, the Family-friendly Companies Awards that were initiated in 1999 are worthy of attention as a measure that had gender equality as its main goal. By giving awards to companies that are assiduously providing support for achieving compatibility between work and family, this system offers an opportunity to provide society with good examples of companies that are leaders in this field, as well as improving the image of the companies that receive awards. It is evident that the reasons why this system was introduced as part of gender equality policies rather than as a measure to counter the declining birthrate include the fact that the system was formulated by the Ministry of Labour, which was in charge of promoting gender equality at that time, rather than the Ministry of Welfare, which was in charge of measures to counter the declining birthrate, as well as the fact that the Corporation Awards for the Promotion of Gender Equality were introduced at the same time as the Family-friendly Companies Awards. Furthermore, in 2007, the two systems were integrated to create the Corporation Awards for the Promotion of Gender Equality and Work-Life Balance. However, the limitations of the awards system are such that only some particularly advanced companies have benefited from the system. Compared with the measures that targeted the majority of companies, such as the reduction in statutory working hours, the introduction of the child care leave system, and measures to support achieving compatibility between work and child rearing based on the Act on Advancement of Measures to Support Raising Next-Generation Children, the influence of the awards system is small.

Up to this point, this paper has focused primarily on policies by the government, but what are the reasons why companies promote WLB measures? Figure 1 shows the reasons given when companies were asked why they implemented measures to support achieving compatibility between work and child rearing. The dark-shaded bars indicate the figures for companies with 300 or more regular employees, while the light-shaded bars indicate those for companies with fewer than 300 regular employees. The figures for the former are taken from a nationwide survey conducted in 2006, while those for the latter are from a survey conducted in 2009, which focused on companies in Osaka Prefecture.

According to this chart, irrespective of the scale of the company, the reason cited by the largest number of companies was "To fulfill our corporate social responsibility,"
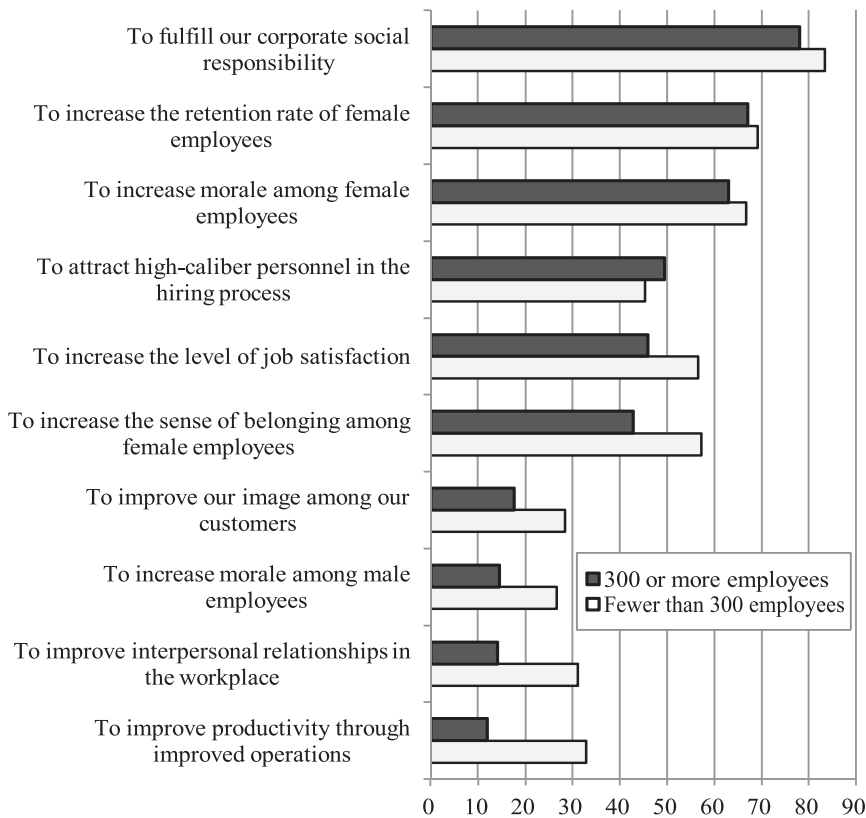
Sources: Figures for companies with 300 or more employees taken from Japan Institute for Labour Policy and Training, *Survey concerning Support for Achieving Compatibility between Work and Family* (conducted in 2006); figures for companies with fewer than 300 employees taken from Research Group on Support for Child Rearing and Corporate Management (Representative: Akira Kawaguchi), *Survey concerning Support for Child Rearing and Corporate Management.*
Notes: 1. "300 or more employees" denotes companies with at least 300 regular employees; these figures are taken from a nationwide survey conducted in 2006. "Fewer than 300 employees" denotes companies with fewer than 300 regular employees; these figures are from a survey conducted in 2009, which focused on companies in Osaka Prefecture.
  2. As there were many responses, only the top ten are shown here.

Figure 1. Reasons for Implementing Support for Achieving Compatibility between Work and Family (Multiple responses permitted, %)

accounting for around 80% in both cases. The companies were not asked what they meant by "social responsibility." Nevertheless, judging from the history of the government's requirement that companies provide support for achieving compatibility between work and family as a measure to counter the declining birthrate, there can be no doubt that the term

"social responsibility" here refers to contributing to measures to counter the declining birthrate. This means that the policies that require companies to implement measures to support achieving compatibility between work and family as part of measures to counter the declining birthrate were effective, to some extent. In Japan's culture, it is perhaps easier for companies to accept WLB measures as measures to counter the declining birthrate, rather than measures to promote gender equality.

However, looking at the reasons listed in second place and below, one can see that there are still quite a few companies that expect measures to support achieving compatibility between work and family to promote more active participation by women, thereby increasing the competitiveness of the company. Irrespective of the scale of the company, around two-thirds of companies cited "To increase the retention rate of female employees" and "To increase morale among female employees." Moreover, among small and medium-sized enterprises, almost 60% of companies cited "To increase the sense of belonging among female employees."

III. The Actual Status of Female Employment since the Equality Act Entered into Force

If WLB policies contribute to achieving gender equality, this is probably because such policies reduce the attrition rate among women, increase the female employment rate, and extend the number of years of continuous service on the part of women, thereby contributing to rises in the proportion of female managers and in women's wages. Accordingly, let us look at the degree to which the attrition rate among women due to marriage and childbirth has actually declined.

Figure 2 shows changes in the attrition rate due to marriage, childbirth and child rearing, and long-term nursing care, as calculated from the Survey on Employment Trends. The attrition rate due to marriage is the figure obtained by dividing the number of female regular employees who have left their jobs due to marriage by the total number of female regular employees. The attrition rates due to childbirth and child rearing, and due to nursing care are calculated in the same way. It should be noted that the figures do not represent the proportion of all those leaving their jobs accounted for by those leaving due to marriage, etc.

The attrition rates due to marriage and childbirth and child rearing are clearly demonstrating a downward trend. In contrast, the attrition rate due to nursing care has remained stable, in general. There is a pronounced decline in the attrition rate due to marriage, which has fallen to more than half the previous level, from 1.66% in 1991 to 0.69% in 2009. The attrition rate due to childbirth and child rearing has also fallen to around 60% of the previous level, from 1.07% in 1991 to 0.62% in 2009.

One of the root causes of the decline in the attrition rate due to marriage is the fall in the number of marriages, which has resulted from the increased tendency to marry later in life or not to marry at all. However, the decline in the number of marriages between 1991
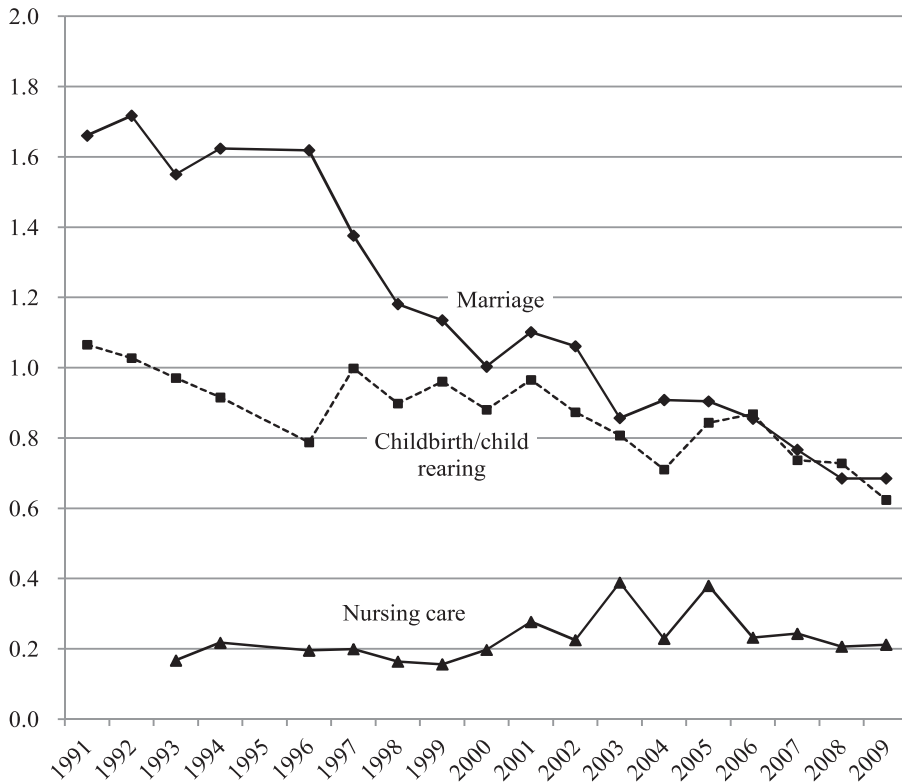
Source: Ministry of Health, Labour and Welfare, *Survey on Employment Trends*, editions for each
    year.
Note: The attrition rate due to marriage was obtained by dividing the number of female regular em-
    ployees who quit their jobs within a particular year due to marriage by the number of female
    regular employees on January 1 that year. The attrition rate due to childbirth/child rearing and
    the attrition rate due to nursing care were obtained in the same way.

Figure 2. Female Attrition Rate by Reason for Quitting (%)

and 2009 was only 5% (National Institute of Population and Social Security Research 2011).
Even taking this into consideration, there has undoubtedly been a considerable decline in
the proportion of women resigning upon marriage. However, the decline in the attrition rate
due to marriage probably results from the effects of a rise in women's desire to work and
changes in customs, rather than the effects of WLB policies. Housework other than child
rearing and providing long-term nursing care is not so difficult as to hinder employment.
Moreover, although WLB policies alleviate the burden of child rearing and long-term nurs-
ing care, their impact on housework other than this is small, so it is thought that they do not
greatly influence decisions to resign upon marriage.

    In contrast to this, it is only natural to think that WLB policies, which are centered on
measures to counter the declining birthrate, are one factor contributing to the decline in the
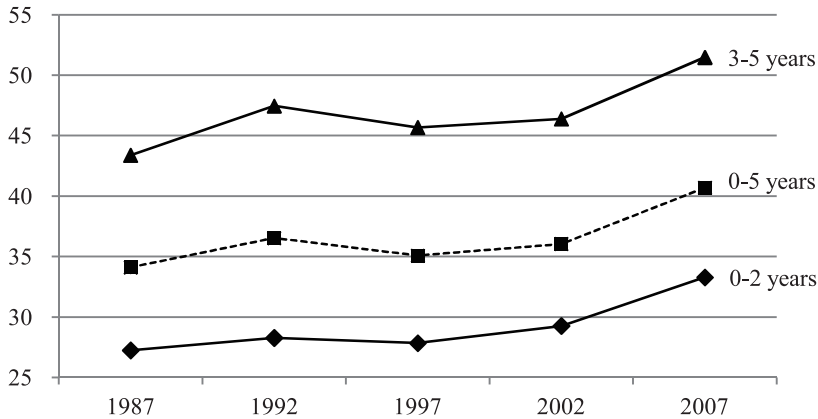
Figure 3. Employment Rate among Married Women by Age of Youngest Child (%)

attrition rate due to childbirth and child rearing. If there is a constant proportion of women who continue to work even after giving birth, the figure for those resigning due to childbirth should increase due to the fall in the number of those resigning due to marriage. The fact that the attrition rate due to childbirth and child rearing is declining despite this means that the number of women continuing in employment after giving birth is increasing.

Figure 3 supports this inference. This depicts the employment rate among married women by age of their youngest child, based on figures from the Employment Status Survey. In the case of married women with a child aged between zero and two years old, no upward trend was seen in the employment rate between 1987 and 1997, but a clear upward trend can be seen from 1997 to 2007. In particular, the figure rose by 4.0 percentage points between 2002 and 2007. A similar tendency can be seen among married women with a child aged between three and five years old. The figure rose by 5.1 percentage points between 2002 and 2007. Although the employment rate among mothers with children of preschool age is low, this has been rising gradually since the beginning of the 2000s.

However, there are also statistics that run contrary to the inference that the proportion of women resigning due to childbirth is declining. According to the 14th National Fertility Survey, in the latter half of the 1980s, 37.4% of women who gave birth to their first child gave up work due to childbirth, but this figure increased to 43.9% in the latter half of the 2000s. Moreover, the proportion of women continuing in employment even after the birth of their first child has only increased very slightly, from 24.0% in the latter half of the 1980s to 26.8% in the latter half of the 2000s (National Institute of Population and Social Security Research 2010). Thus, the results differ according to the statistics, so it is not possible to state categorically that the proportion of women resigning due to childbirth has been decreasing in recent years.
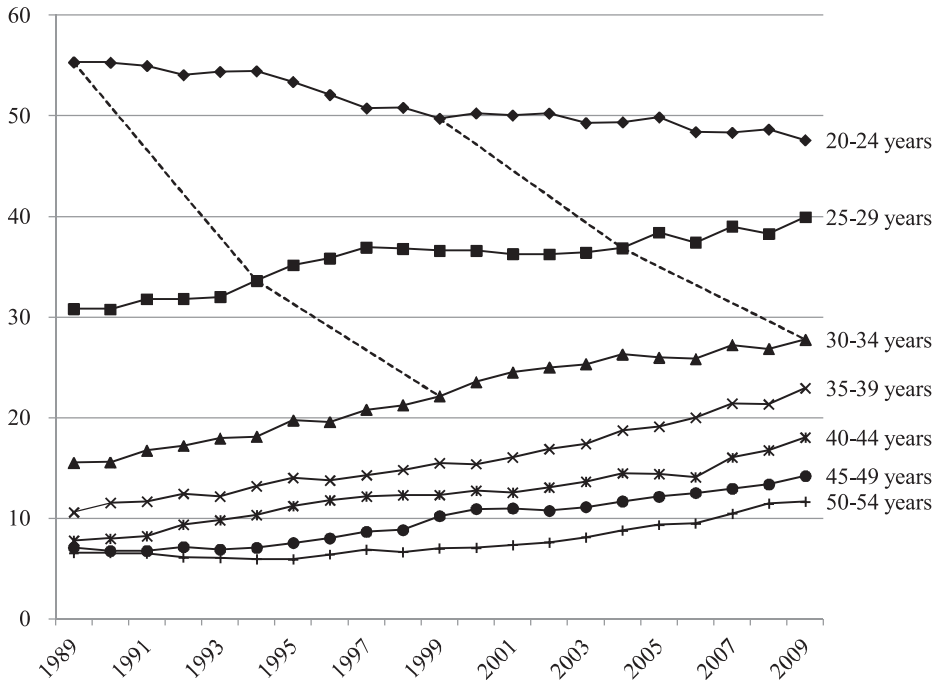
Source: Ministry of Health, Labour and Welfare, *Basic Survey on Wage Structure*, editions for each year.

Note: Long-standing workers are those workers whose age when they joined the company where they currently work was 16 or under, in the case of those who joined the company after graduating from junior high school, 19 or under, in the case of those who joined after graduating from high school, 21 or under, for those who joined after graduating from junior college or technical college, and 24 or under, for those who joined after graduating from university.

Figure 4. Proportion of Women among Long-Standing Staff Members
by Age Bracket (%)

So is the retention level of women in companies rising? In order to see changes in the retention level, let us look at the proportion of women among long-standing staff members. Figure 4 shows changes in the proportion of women among long-standing staff members by age bracket. The Basic Survey on Wage Structure has been used to obtain these figures. Here, the term "long-standing staff member" refers to workers who have continued working at the company where they were first employed, ever since they graduated from school. However, one cannot tell precisely whether or not a person has experience of changing job, so here, the term "long-standing workers" is defined as referring to those workers for whom the difference between the age they were when they completed their highest level of schooling (15 in the case of junior high school graduates, 18 in the case of high school graduates, 20 in the case of junior college or technical college graduates, and 22 in the case of university graduates) and the age at which they joined the company is less than one year

(less than two in the case of university graduates[3]).[4]

At most companies, being a long-standing staff member places a worker at an advantage when being considered for a managerial post. For example, the proportion of long-standing staff members among those at departmental director level in 2009 was 52%, while such staff members accounted for 58% of those at divisional director level. Consequently, the proportion of women among those in managerial posts also shows the degree of ease with which women achieve promotion.

According to Figure 4, in the 20–24 age bracket, the proportion of women among long-standing staff members is declining. This is thought to be because the proportion of women among new graduates hired is falling. In all other age brackets, the proportion of women among long-standing staff members is rising. As a result, the distance between the lines for the first half of the 20s and the latter half of the 20s is decreasing. Moreover, the distance between the lines for the latter half of the 20s and the first half of the 30s is decreasing somewhat. This means that the retention rate of women in their 20s and early 30s is rising relative to that of men.

One can clearly see that the level of female retention in companies is rising in relative terms if one looks at the figures in cohort terms. The broken lines in Figure 4 depict changes in the proportion of women among long-standing staff members among two cohorts. The proportion of women among long-standing staff members in the cohort that was aged between 20 and 24 in 1989 (those born between 1965 and 1969) declined by 21.7 percentage points over the five years that followed, falling by a further 11.5 percentage points over the next five years after that. Of the two broken lines on this chart, the left-hand one depicts this. In contrast, the proportion of women among long-standing staff members in the cohort born ten years later (those born between 1975 and 1979, aged between 20 and 24 in 1999, right-hand broken line) only declined by 12.9 percentage points in the five years from 1999 and then by just 9.1 percentage points in the five years from 2004. This means that the level of female retention in companies between their mid-20s and their mid-30s—the period when they are most likely to marry and have children—has risen in relative terms.

So, has this relative rise in the level of female retention in companies increased women's economic status? Figure 5 depicts changes in the relative wage of women and the

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[3] The Basic Survey on Wage Structure does not distinguish between university graduates and graduate school graduates, so all are treated as university graduates and the age at the time of joining the company is calculated accordingly.

[4] When looking at the level of retention within a company, the average number of years of continuous service by age bracket is often used, but this entails the problem that it is affected more by fluctuations in mid-career employment than by fluctuations in the number of those resigning due to marriage or childbirth. The proportion of women among long-standing staff members does not entail this kind of problem, but it does present the difficulty that it is affected by changes in the proportion of women among those hired as new graduates. However, this problem can be resolved to some extent by looking at changes in the proportion of women among long-standing staff members by age in each cohort.
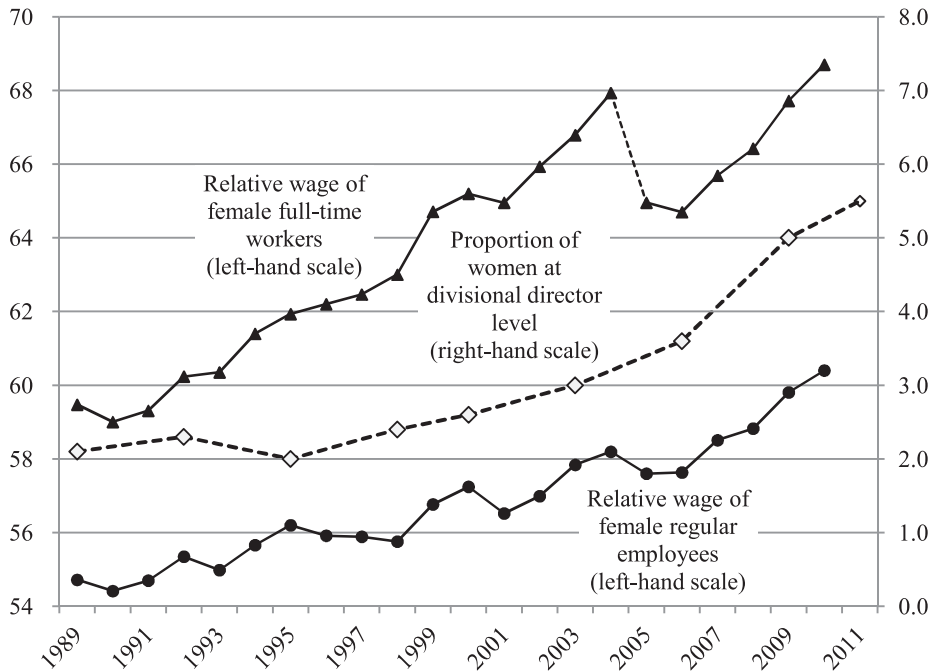
Sources: Ministry of Health, Labour and Welfare, *Basic Survey of Gender Equality in Employment Management*, editions for each year; and Ministry of Health, Labour and Welfare, *Basic Survey on Wage Structure*, editions for each year.

Note: Figures for the relative wage of women are based on data from companies with five or more regular employees, while figures for the proportion of women at divisional director level are based on data from companies with 30 or more regular employees.

Figure 5. Relative Wage of Women and Proportion of Female Managers (%)

proportion of female managers. With regard to the relative wage for women, this chart shows data for both regular employees and full-time workers. Regular employees consist of both full-time and part-time workers. Part-time workers are defined as "workers whose daily prescribed working hours are shorter than those of general workers, or, if their daily prescribed working hours are the same as those of general workers, have fewer days in their prescribed working week than do general workers." Relative wage is the mean hourly wage for women divided by the mean hourly wage for men, multiplied by 100.[5]

Over the 20 years from 1990 to 2010, the relative wage for female full-time workers

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[5] The relative wage of women among full-time workers declined considerably from 2004 to 2005 because the term for part-time workers, which had been "*paato*" until 2004, was changed to "*tanjikan roudousha*" (the latter literally means "short-hour workers," but both are translated as "part-time worker" in English). Despite the fact that there was no change in the definition itself, it can be inferred that this occurred because the change in appellation led to some workers, who had hitherto been classified as "*paato*," being classified as full-time workers.

has risen by 9.7 percentage points, from 59.0 to 68.7.[6] However, during the same period, the relative wage for female regular employees—a figure that includes part-time workers—has only risen by 6.0 percentage points, from 54.4 to 60.4. The main reason for this disparity is the fact that the number of female part-time workers has increased. The relative wage among regular employees has been rising at a pace of no more than 0.3 percentage points per year.

On the other hand, the proportion of women at divisional director level has risen by 3.4 percentage points, from 2.1% in 1989 to 5.5% in 2011. The figure rose by only 0.5 percentage points between 1989 and 2000, but it has risen by 2.9 percentage points between 2000 and 2011. There is a possibility that the rate of increase in the number of women at divisional director level has accelerated somewhat in the 2000s.

Accordingly, it is evident that, over the past 20 years, the level of female retention in companies has been demonstrating an upward tendency compared with that of men, due to the impact of such factors as the decline in the number of women resigning due to marriage, the tendency to marry later in life, and the declining birthrate. However, it is unclear whether or not the proportion of women quitting their jobs due to childbirth is decreasing. Women's relative wage and the proportion of women at divisional director level are rising, with the rise in women's relative wage being very gradual and that in the proportion of women at divisional director level having accelerated somewhat since 2000. However, it is unclear from macro-level data whether or not WLB policies have increased the retention rate of women in companies and promoted more active participation by women. Accordingly, the following section uses data for individual companies to discuss what kind of effects WLB measures by companies have had on the retention rate of women in companies and their promotion to managerial posts.

IV. An Empirical Analysis of Measures to Promote a Better Work-Life Balance, Continued Female Employment and Gender Equality

1. Hypotheses

This section firstly verifies the hypothesis "the more assiduously a company implements WLB measures, the higher the level of female retention within the company," and then verifies the hypothesis "the higher the level of female retention, the greater the proportion of female managers."

2. Database

The database used for this empirical analysis is the Survey Concerning Support for Achieving Compatibility between Work and Family. This survey was conducted between

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[6] Due to the reasons given in Note 5, it can be inferred that the relative wage of female full-time workers compared to male workers actually rose by more than 9.7 percentage points.

June 28 and July 21, 2006 by the Japan Institute for Labour Policy and Training. The survey subjects were 6,000 companies with 300 or more regular employees nationwide; they underwent stratified random sampling by category of business and by scale. The study consists of three surveys—a survey of companies, a survey of those in managerial posts, and a survey of ordinary staff members—but this paper uses only the data from the survey of companies. Valid responses to the survey of companies were received from 863 companies (valid response rate of 14.4%).[7]

3. Variables

The following provides an explanation of the variables used in the estimates. The descriptive statistics for the variables are shown in Table 2. "Number of years of continuous service by women" and "Timing of women quitting their jobs" are used as variables in order to ascertain the level of female retention in companies. The former variable is easy to understand, but at companies that are increasing the number of staff they hire because their business performance is improving, there is the problem that the average length of continuous service becomes shorter. In order to adjust for this, "Number of years of continuous service by men" is used as an explanatory variable.

The variable "Timing of women quitting their jobs" has been calculated from questions about the life stage at which most female workers resign, such as upon marriage or childbirth. In this variable, the response "Resign at their own convenience before marriage" scores 1 point, "Resignation triggered by marriage" scores 2 points, "Resign after marriage, before pregnancy or childbirth" scores 3 points, "Resignation triggered by pregnancy or childbirth" scores 4 points, "Use child care leave after birth, but resign within a year or two afterwards" scores 5 points, and "Use child care leave after birth and continue working thereafter" or "Continue working after birth, without using child care leave" both score 6 points.

The "Existence of female managers dummy" and the "Proportion of female managers" are used as variables to ascertain how actively women are participating in companies. The former is a dummy variable set at 1 in the event that there are female departmental or divisional directors, while the latter is the proportion of female departmental or divisional directors.

"WLB orientation of senior management" and "Number of measures to support child rearing actually used" are used as variables to ascertain how assiduously companies are implementing WLB measures. "WLB orientation of senior management" involves using a five-rank scale (agree, somewhat agree, neither agree nor disagree, somewhat disagree, disagree) to evaluate the management policies of senior management concerning personnel

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[7] For a detailed explanation of the survey and the cross tables, please refer to The Japan Institute for Labour Policy and Training (2007). Kawaguchi (2008) used this survey to study WLB measures and the active participation of women. However, this study did not analyze the impact of WLB measures and the level of female retention in companies on the proportion of female managers.

Table 2. Descriptive Statistics

	Overall			Companies with female managers		
	Observations	Mean value	Standard deviation	Observations	Mean value	Standard deviation
Existence of female managers dummy	624	0.638	0.481	398	1.000	0.000
Proportion of female managers	532	0.084	0.165	321	0.139	0.193
Timing of women quitting their jobs	612	3.974	2.094	388	4.155	2.102
Number of years of continuous service by women	549	11.31	6.045	357	11.22	6.102
Number of years of continuous service by men	553	14.96	6.112	357	14.44	6.416
WLB orientation of senior management	618	0.667	0.187	393	0.691	0.189
Equality orientation of senior management	613	0.767	0.189	389	0.812	0.172
Number of measures to support child rearing actually used	624	2.962	2.225	398	3.415	2.309
Number of PA measures being implemented	624	1.604	2.227	398	1.915	2.422
Number of PA measures not required to be implemented	624	0.894	2.209	398	1.211	2.509
Logarithmic value of the number of regular employees	624	6.566	0.876	398	6.681	0.995
Logarithmic value of the number of those in managerial posts	532	4.501	1.233	321	4.751	1.350

Note: "Managerial posts" refers to posts equivalent to divisional director and departmental director level.

management in relation to each of the following five statements: "There is widespread knowledge among employees of our company's support for achieving compatibility between work and family, such as child rearing support systems"; "We are striving to enable employees to continue working even after marriage/childbirth"; "We also encourage men to actively take child care leave"; "We are seeking the understanding of employees' family responsibilities in the workplace (among bosses and colleagues)"; and "We are seeking the cooperation of those in the workplace (bosses and colleagues) concerning leave and short-time work related to child care." Each response on the five-rank scale was awarded 4, 3, 2, 1, or 0 points, respectively, and the total score for all five statements was then divided

by 20. In other words, it has been adjusted so that the highest score is 1 point and the lowest is 0 points.

"Number of measures to support child rearing actually used" is the number of systems that were actually used in the past three years from among the following: short-time work; flexi-time; bringing forward or pushing back work start/finish times; not making staff members work overtime; operating an in-house day-care center; measures to subsidize the cost of child care services, etc.; support for returning to the workplace; granting men leave when their spouse gives birth; sick/injured child care leave; exemption from intra-company transfers (region-specific staff member system, etc.); priority re-employment system for those who have resigned due to child rearing, etc.; and home-working while bringing up children.

"Equality orientation of senior management" and "Number of positive action (hereafter abbreviated to PA) measures being implemented" are used as variables to ascertain how assiduously companies are striving to achieve gender equality. "Equality orientation of senior management" involves using a five-rank scale (agree, somewhat agree, neither agree nor disagree, somewhat disagree, disagree) to evaluate the management policies of senior management concerning personnel management in relation to each of the following four statements: "We actively utilize and appoint women"; "We engage in human resource development, irrespective of gender"; "We assign to women not only routine work, but also work that is highly creative"; and "We have ensured widespread knowledge of the measures that will be taken in the event that an employee has suffered harm, such as sexual harassment or bullying." Each response on the five-rank scale was awarded 4, 3, 2, 1, or 0 points, respectively, and the total score for all four statements was then divided by 16. In other words, it has been adjusted so that the highest score is 1 point and the lowest is 0 points.

"Number of PA measures being implemented" is the number of systems that are being implemented from among the following: establishing a dedicated department or staff member to deal with PA; conducting surveys and analyzing problems; formulating plans to enable women to demonstrate their abilities; actively appointing women to posts; active education and training in order to enable women to work in workplaces where there are few women at present; establishing a dedicated consultation service for women; formulating regulations to prevent sexual harassment; developing support for achieving compatibility between work and family above and beyond what is required in law; improving awareness and attitudes among male staff members; and improving the workplace environment and culture.

There are also companies that are not implementing PA because they believe that women participate sufficiently actively within the company. In order to distinguish such companies from companies that are not interested in active participation by women, "Number of PA measures not required to be implemented" is used as an explanatory variable. This variable is the number of measures from among the aforementioned PA measures, in relation to which a company believes "There is no need to implement this measure as women

already participate sufficiently actively."

"Logarithmic value of the number of regular employees," "Labor union dummy" and "Industry dummy" are used as the other control variables. Moreover, in estimates of the "Existence of female managers dummy," "Logarithmic value of the number of those in managerial posts" is used as the explanatory variable. This is because the probability of female managers existing is higher in companies with more managerial posts.

4. Results of Estimates

Table 3 shows the results of estimates of the level of female retention. Models (1) to (4) take "Number of years of continuous service by women" as the explained variable, while Models (5) to (8) take "Timing of women quitting their jobs" as the explained variable. The former is estimated using OLS, while the latter is estimated using ordered probit. As is evident from Models (1), (2), (5) and (6), the coefficient of "WLB orientation of senior management" is significantly positive at the 5% level at least. The coefficient of "Number of measures to support child rearing actually used" is not significant in Models (3) and (4), but in Models (7) and (8) it is significantly positive at the 5% level at least. From these outcomes, one can say that the hypothesis that "the more assiduously a company implements WLB measures, the higher the level of female retention within the company" is supported.

In contrast, the coefficient of "Equality orientation of senior management" is significantly positive at the 10% level in Model (6), but it is not significant in any other model. "Number of PA measures being implemented" is not significant in any of the models. From this, one can say that initiatives focused on measures to promote gender equality do not have much of an effect on rises in the level of female retention.

Table 4 shows the results of the estimate of the proportion of female managers. At quite a large proportion of companies (36.2%), there were no female managers at all, so a two-stage estimation method was used for the estimate. This is because it is anticipated that the hurdles that the first female manager has to overcome in order to achieve promotion are higher than those that have to be overcome by the second and subsequent female managers. At the first stage, probit is used to estimate whether or not there are any female managers, while at the second stage, the proportion of female managers at companies that have female managers is estimated using OLS. The logarithmic value of the number of those in managerial posts is added as an explanatory variable to the first stage estimate, while the inverse Mills ratio is added as an explanatory variable to the second stage estimate.

Looking at the results of the estimates, the coefficient of "Number of years of continuous service by women" is significantly positive at the 5% level at least in both the first and second stage estimates. The coefficient of "Timing of women quitting their jobs" is not significant in the first stage estimate in Model (4), but it is significant at the 5% level at least in all other models. From this, one can say that the hypothesis that "the higher the level of female retention, the greater the proportion of female managers" is supported. This is

Table 3. Impact of WLB Measures on Women's Continuation in Employment

	OLS: Explained variable = number of years of continuous service by women				Ordered probit: Explained variable = Timing of women quitting their jobs			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
WLB orientation of senior management	3.284 *** (1.007)	3.855 *** (1.325)	-	-	1.170 *** (0.290)	0.735 ** (0.376)	-	-
Equality orientation of senior management	-	1.003 (1.575)	-	-	-	0.756 * (0.397)	-	-
Number of measures to support child rearing actually used	-	-	0.107 (0.077)	0.090 (0.081)	-	-	0.082 *** (0.027)	0.061 ** (0.028)
Number of PA measures being implemented	-	-	-	-0.041 (0.077)	-	-	-	0.028 (0.026)
Number of PA measures not required to be implemented	-	-	-	0.157 ** (0.070)	-	-	-	0.088 ** (0.025)
Number of years of continuous service by men	0.696 *** (0.039)	0.692 *** (0.040)	0.697 *** (0.040)	0.700 *** (0.040)	0.034 *** (0.010)	0.037 *** (0.010)	0.036 *** (0.010)	0.038 *** (0.010)
R2	0.5683	0.5674	0.5614	0.5647	0.0535	0.0554	0.0490	0.0579
Observations	540	540	545	545	538	533	540	540

Notes: 1. All models have the industry dummy, the logarithmic value of the number of regular employees, and the labor union dummy as explanatory variables.

2. Figures in brackets show the standard error.

3. * denotes significance at the 10% level, ** at the 5% level, and *** at the 1% level.

Table 4. Impact of WLB Measures on the Proportion of Female Managers

Stage 1 Probit: Explained variable = Existence of female managers dummy				
	(1)	(2)	(3)	(4)
Number of years of continuous service by women	0.040 ** (0.018)	-	0.041 ** (0.017)	-
Timing of women quitting their jobs	-	0.064 ** (0.033)	-	0.052 (0.033)
Number of years of continuous service by men	-0.045 ** (0.019)	-0.020 (0.013)	-0.050 *** (0.018)	-0.025 * (0.013)
WLB orientation of senior management	-0.429 (0.492)	-0.408 (0.483)	-	-
Equality orientation of senior management	2.179 *** (0.518)	2.090 *** (0.506)	-	-
Systems to support child rearing actually used	-	-	0.121 *** (0.036)	0.120 ** (0.035)
Number of PA measures being implemented	-	-	0.070 ** (0.032)	0.063 * (0.032)
Number of PA measures not required to be implemented	-	-	0.137 *** (0.043)	0.134 *** (0.043)
Logarithmic value of the number of those in managerial posts	0.428 *** (0.106)	0.363 *** (0.104)	0.491 *** (0.109)	0.421 *** (0.107)
Pseudo R2	0.2139	0.2077	0.2341	2286
Observations	471	469	480	475
Stage 2 OLS: Explained variable = Proportion of female managers				
	(1)	(2)	(3)	(4)
Number of years of continuous service by women	0.011 *** (0.002)	-	0.008 *** (0.002)	-
Timing of women quitting their jobs	-	0.025 *** (0.005)	-	0.015 *** (0.004)
Number of years of continuous service by men	-0.015 *** (0.002)	-0.009 *** (0.002)	-0.012 *** (0.002)	-0.008 *** (0.002)
WLB orientation of senior management	-0.010 (0.061)	-0.008 (0.062)	-	-
Equality orientation of senior management	0.445 *** (0.094)	0.481 *** (0.098)	-	-
Systems to support child rearing actually used	-	-	0.015 *** (0.006)	0.017 *** (0.006)
Number of PA measures being implemented	-	-	0.009 ** (0.004)	0.009 *** (0.004)
Number of PA measures not required to be implemented	-	-	0.030 *** (0.005)	0.031 *** (0.005)
Inverse Mills ratio	0.243 ** (0.051)	0.301 *** (0.054)	0.140 *** (0.045)	0.179 *** (0.049)
Pseudo R2	0.4503	0.4633	0.5212	0.523
Observations	291	284	299	290

Notes: 1. "Managerial posts" refers to posts equivalent to divisional director and departmental director level.

2. All models have the industry dummy, the logarithmic value of the number of regular employees, and the labor union dummy as explanatory variables.

3. Figures in brackets show the standard error.

4. * denotes significance at the 10% level, ** at the 5% level, and *** at the 1% level.

consistent with the results obtained by Matsushige and Takeuchi (2008).

Looking at the other coefficients, the coefficients of "Equality orientation of senior management" and "Number of PA measures being implemented" are significantly positive at the 5% level at least, apart from in the first stage of Model (4). It can be surmised that the outcomes of efforts by companies that are assiduously striving to achieve gender equality become apparent in the form of an increase in the number of female managers. Furthermore, the coefficient of "Number of measures to support child rearing actually used" is significant at the 5% level at least in both the first and second stage estimates in Models (3) and (4). This might be because there is a reverse causal relationship, in that the existence of female managers makes it easier to use child rearing support measures.

V.   Conclusion

This paper has analyzed the objectives of the government's introduction of WLB policies and companies' introduction of WLB measures since the Equal Employment Opportunity Act entered into force, and the effects that these have had on the level of female retention and their active participation in companies. As a result, the following has become clear. Firstly, the government's main WLB measures over the last quarter of a century have been implemented as measures to counter the declining birthrate. The vast majority of companies provide support for achieving compatibility between work and child rearing as part of their efforts to make a contribution to society. However, around two-thirds of companies have implemented measures to support achieving compatibility between work and family, with the expectation that this will improve the motivation of female workers and increase their retention within the company.

Secondly, over the last 20 years, the number of women leaving their jobs due to marriage has declined considerably and the level of female retention, as seen in terms of the proportion of women among long-standing staff members, has steadily increased. At the same time, women's relative wage has also risen. However, it is unclear whether or not the proportion of women quitting their jobs due to childbirth has decreased. Moreover, since 2000, the employment rate among women with preschool-age children has risen, as has the proportion of female managers. However, the rate of increase in the relative wage of women is very low.

Thirdly, comparing individual companies, the more assiduous the senior management at a company is about WLB measures and the greater the number of child rearing support measures that are actually used, the higher the level of female retention; and the higher the level of female retention at a company, the greater the proportion of female managers. Consequently, looking at the situation at the company level, one can say that WLB measures contribute to female retention in companies, and also contribute to their participating more actively in those companies.

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Changes in Human Resource Management of Women after the 1985 Equal Employment Opportunity Act

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Looking at transitions in the human resource management of women following the Equality Act, this was a period in which the focus shifted from double-tracked personnel management and the career break system to so-called family-friendly systems, which are systems to support achieving compatibility between work and family, such as child care leave systems. Double-tracked personnel management was designed to deal with the disparity between men and women in their separation rates at large corporations, but this disparity is still an issue because the system cannot adapt to changes in people's outlook concerning their life course. The career break system was a system aimed at making effective use of women with children before the child care leave system existed, but rather than being an alternative, the latter has a complementary relationship to the former. The primary focus of family-friendly systems is the child care leave system, but the system of short-time work when raising children is an important point that is linked to the short-time regular employee system. Determining how to evaluate staff members who are on leave or working shorter hours will be the key to ensuring that these systems become firmly established. The operation of these systems in such workplaces will lay the foundations that will enable measures to promote a better work-life balance, which have a broader scope than family-friendly systems, to become firmly established. The human resource management of part-time employees is also linked to issues in the human resource management not only of middle-aged women, but also of workers other than full-time regular employees. Thus, in recent years, the human resource management of women is increasingly encompassing issues common to all employees, whether male or female, full-time or part-time.

I.   Human Resource Management of Women before the Equality Act

Although it is a long-standing challenge, the human resource management of women is an issue at the very forefront of Japanese society. In the modern era, it has increasingly encompassed issues common to all employees, including men. To put it another way, pioneering measures to deal with these issues have come to be incorporated into and practiced in workplaces with a progressive approach to the human resource management of women. Looking at the history of the human resource management of women, it can be said that it has developed in response to changes in the typology of workplaces,[1] as shown in Figure 1. Of course, it can also be said that proactive reforms of human resource management have also brought about a change in the typology of workplaces. This paper examines transitions in the human resource management of women, focusing primarily on the period from the

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[1] See Wakisaka (1998a) regarding the typology of workplaces.
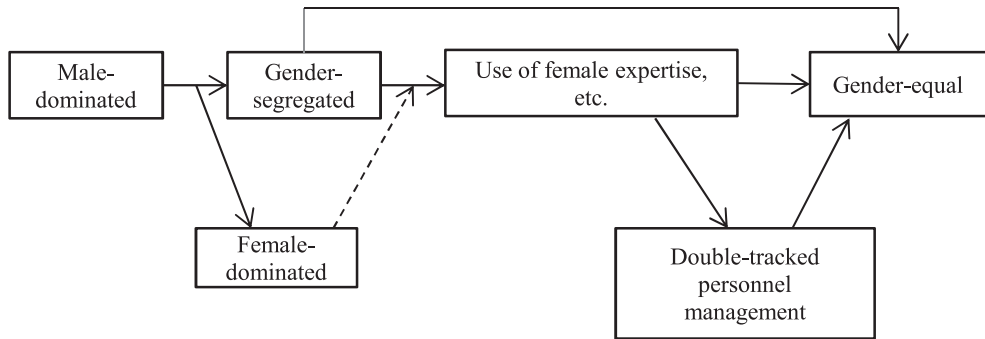
Figure 1. Development Stages in the Use of Women

1986 entry into force of the Equal Employment Opportunity Act (hereinafter referred to as the "Equality Act"). However, it does not touch upon the human resource management of part-time employees or human resource management pertaining to measures to promote a better work-life balance, both of which issues are closely associated with women.

Compared with other developed countries, a high proportion of women in Japan worked in days gone by. This was because many women were self-employed or family workers, working in sectors including agriculture, but it was only after the war that the number of working women employed at companies (and therefore subject to human resource management) increased. Even before the war, there were "*joko* (factory girls)," who were factory workers employed primarily in silk-reeling and spinning plants, and "*shokugyo-fujin* (office girls)," whom in modern times we would describe as white-collar workers.[2] There are many studies concerning the human resource management of factory girls. In addition, as shown below, first-hand accounts from office girls are recorded in the 1926 study entitled *The Lives of Office Girls* carried out by the Hiroshima Municipal Government Department of Social Affairs, from which the types of problem that arose in terms of human resource management can be seen.

"I'd like to be paid a monthly salary, rather than a daily wage, and I long for women to be treated equally in all respects."

"There is little sense of friendliness between our superiors, such as departmental directors and section chiefs, and us lowly clerks. If we happen to have a bad boss, either our skills aren't recognized or we frequently end up becoming entangled in unexpected problems, which cause us considerable anguish."

"Holding lectures and courses—the most embarrassing thing since finding employ-

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[2] *Shokugyou-fujin* were not necessarily only white-collar workers and the term was also used when referring to all female employees, but in general it referred to white-collar workers, as the term is used in the modern age. The study concerning office girls carried out by the Hiroshima Municipal Government Department of Social Affairs referred to in this sentence focused on female workers including teachers, clerical workers, typists, telephone operators, midwives and nurses. (*Anthology of Data from Studies of Workers' Lives*, Vol. 5)

ment is my lack of education and general knowledge. Every time I feel this keenly, I wish that someone would hold truly substantial lectures on such matters as current affairs and ideological issues, or organize appropriate courses that provide a meticulous grounding (in matters that are necessary and important when working)."

"Convenient training centers—more than half of us work in order to earn money to pay for the costs of lessons that we are taking independently, so we want facilities that would enable us to take all our training courses in the same place, in order to save time."

"(Request for) the establishment of baby-minding and childcare facilities (brackets are author's own)."

At the time, most were primarily female-dominated workplaces in which numerous women worked together, but one can detect that the advance of office girls into male-dominated workplace was being seen. During the war, there was a time when female workers advanced into male workplaces in earnest, due to conscription; various conflicts occurred as a result, and problems associated with morals became an issue in human resource management.[3]

The words used to describe female labor in the postwar period changed as pseudo-Anglicisms became more prevalent. The acronym "BG (Business Girl)" was coined by author Chiyo Uno, while the weekly magazine *Josei Jishin* chose the acronym "OL (Office Lady)"; the factor behind the popularization of these terms was the sharp increase in clerical posts.[4] Women undoubtedly advanced into male-dominated workplaces, but in terms of the content of the work and careers within the company, they were mainly gender-segregated workplaces. In terms of the main focus of human resource management of women in large corporations, this was a period in which the main challenge for those in charge of personnel was how best to rotate unmarried women, who would resign upon their marriage.

Even if the workplace environments in which they worked and the skills required differed, the main point in common was the fact that in these workplaces, women were segregated from the work and careers of men. This situation began to change from the latter half of the 1970s. Signs of a change toward so-called "gender-equal" workplaces began to emerge. Having said which, this was not the case in most workplaces.

In 1978, the former Ministry of Labour (currently known as the Ministry of Health, Labour and Welfare) carried out a survey of workers who had at least a bachelor's degree. The survey was conducted among 4,700 business establishment, targeting those who had been hired between 1973 and 1977. At the time, although their numbers had increased, the university advancement rate among women was less than 10%, so female university graduates were an elite. Looking at the separation rate among women with five years of continu-

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[3] Wakisaka (1989a, 1989b.) looked at banks as an example of the feminization of the labor market during the war.

[4] For more details concerning the terms BG and OL, see Wakisaka (1997b).

ous service, of the business establishments in which workers had resigned (72%), almost 90% had a separation rate of at least 50%. Moreover, more than one-third of business establishments had a separation rate of at least 90%. In 41.5% of all business establishments, nine out of ten female university graduates resigned within five years. From this fact one can infer that, while there might perhaps have been women who resigned of their own volition due to marriage, it is unlikely that decent human resource management of female university graduates was being carried out at most of these companies. This was the situation during the era when university graduates were an elite minority, even at workplaces where there was considerable potential for gender equality.

Pioneering initiatives focused on creating gender-equal workplaces began to be seen from the latter half of the 1970s, in such environments as the shop floors at General Merchandise Stores (Wakisaka 1986). However, the real factors behind the acceleration in the emergence of gender-equal workplaces were the Equality Act, which entered into force in 1986, and the economic bubble that arose around that time, after Japan broke free from a recession caused by a strong yen. Workplaces emerged in which men and women did the same jobs and this ceased to be unusual. To put it in terms of the expression that became prevalent at the time, these working women were "career women," and there was an increase in career-focused positions with a prospect of promotion, based on a consciousness of the double-tracked personnel management (DPM) that is described below.

II. The Outcomes of the Equal Employment Opportunity Act

1. The Significance of the Equality Act

Why did gender-segregated workplaces, in which the work and careers of men and women differed, emerge? According to the economic theory of statistical discrimination, which can be used to explain the differences between men and women in terms of work, the reason is as follows. Even if a company is able to gain a complete understanding of a woman's skills, it runs a considerable risk that the majority of women who are hired and entrusted with important work will resign, so it cannot use women. The risk is that if that company alone were to use women, it might lose out in the market to competing companies that only entrust important work to men. If all competitors ran the same risk in regard to the use of women, they would be competing on a level playing field, but the risk is high if just one company does it. Even if commentators say the companies that do not run this risk are not real enterprises, the fact that the majority of women hired resign within five years means that the risk is too great.

In this kind of situation, the law (with its coercive power) has considerable significance. In a situation in which the risk is too great for a single company, making all companies subject to a legally-binding requirement to avoid discriminating between men and women provides companies with the opportunity to employ competent women who will not resign. The Equality Act that entered into force in 1986 did not contain any provisions

Table 1. Outline of the Equal Employment Opportunity Act

Effective year	1999	1986
Official name	Act on Securing, Etc. of Equal Opportunity and Treatment between Men and Women in Employment	Act on Respecting the Improvement of the Welfare of Women Workers, including the Guarantee of Equal Opportunity and Treatment between Men and Women in Employment
Recruitment	Prohibited	Obligation to make an effort is stipulated
Deployment/Promotion	Prohibited	Obligation to make an effort is stipulated
Education and training	All education and training is covered.	Limited to education and training for providing basic skills (off-JT)
Sexual harrassment	Prohibited	No specific provisions
Positive Action (Positive measures to promote gender equiality)	Stipulation of rules (national support for measures taken by employers)	No specific provisions
Obligation for health care before pregnancy and childbirth	Obligation stipulated	Obligation to make an effort is stipulated
Calling of the Conciliation Commission	The Commission may be called when either party applies for conciliation. Any disadvantageous treatment by reason of application for conciliation is prohibited.	Where either party applies for conciliation, the Commission may be called only when the other party gives consent. No specific provisions
Announcement of the names of companies failing to comply with recommendations by the Minister of Labour	Names are announced.	No specific provisions

regarding this, but the revised Equality Act that entered into force in April 1999 stipulated that there must be no discrimination between men and women in any form of education and training. What is called on-the-job training (OJT) is also included in this. OJT is the fundamental element in skills development and, consequently, is the basis that enables employees to demonstrate their abilities, so if disparities between men and women in this area are eliminated, substantial disparities between men and women in terms of deployment will also disappear, thereby speeding up progress along the path toward the full-scale utilization of women.

     If the situation were to evolve in this way, the vicious circle of "Most women quit

even if we hire them" → "We can't entrust important work to women" → "There is no work with any career prospects so women quit" → "So we really can't entrust important work to women" will be broken and the chicken-and-egg situation of "Is it women or companies who are in the wrong?" can also be eliminated. It was anticipated that the positive action provision incorporated into the revised Equality Act of 1999 would also assist in accelerating equality (see Table 1).

2. Effects

Due to the effects of business cycles, it is not easy to ascertain what kind of impact the Equality Act has had on companies and the employment of women. For example, the latter half of the 1980s—the period after the enactment of the Equality Act in 1985—was the middle of the economic bubble. Accordingly, it is difficult to distinguish between the hiring and use of women that occurred because the economy was booming and there was a labor shortage, and that which occurred because of the effect of the law. The best way of gaining an understanding of this is to conduct numerous exhaustive case studies of companies and workplaces. However, it is also necessary to quantify at least some of these for discussion.

The author has carried out the task of compiling the EO points that indicate the level of equality of opportunity between men and women (and, latterly, the FF points in relation to the level of family-friendliness) on an ongoing basis. It is not possible to state objectively how many points are scored for which system and how many points are scored for which kind of situation unless one has amassed a number of studies. However, an academic discussion can be developed by stipulating the method used to compile the index and by interpreting the results of the analysis based on that index. The following provides an introduction to the EO point results using individual responses from the former Ministry of Labour's Basic Survey on Women's Employment Management. The EO points referred to here are a scoring system wherein companies that employ only men have a point deducted, while those that employ both men and women are awarded a point (Table 2).

Under this scoring system, large-scale companies and the finance and insurance sector have a high EO point score. Looking at changes in responses to the same question from 1989 to 1998 (Figure 2), one can see that the level of equality as expressed in terms of EO points is rising in general, apart from in the areas of recruitment, hiring and training. Scores for recruitment began to rise again in 1998 after a decline, while those for training have remained level. The reason why the EO point scores have fallen in the area of hiring is thought to be that this period was the "lost decade" following the collapse of the economic bubble, so the employment situation was difficult and the number of so-called "companies hiring only men" increased. Incidentally, under this scoring system, there is no change in the EO point scores of companies hiring neither men nor women. However, the fact that EO point scores in areas such as deployment are rising demonstrates that the employees that companies have at present are becoming more equal. This tendency is the same in all of the

Table 2. Compilation of the EO Point Score

Content	Scoring method
• New graduates (university)/Recruitment status of clerical and sales staff • New graduates (university)/Recruitment status of technical staff • New graduates (high school)/Recruitment status of clerical and sales staff • New graduates (high school)/Recruitment status of technical staff • Mid-career employment recruitment status	In the event of the response "Same for all occupations and tracks," 1 point is awarded for the response "Recruiting both men and women," while 1 point is deducted for "Recruiting only women" and "Recruiting only men." In the event of the response "Differs depending on occupation and track," 1 point is awarded for the responses "Recruiting both men and women and recruiting only women," while 1 point is deducted for "Recruiting both men and women and recruiting only men," "Recruiting both men and women, recruiting only women, and recruiting only men" and "Recruiting only women and recruiting only men." 0 points are awarded for "No recruitment."
• New graduates (university)/Hiring status of clerical and sales staff • New graduates (university)/Hiring status of technical staff • New graduates (high school)/Hiring status of clerical and sales staff • New graduates (high school)/Hiring status of technical staff • Mid-career employment hiring status	In the event of the response "Same for all occupations and tracks," 1 point is awarded for the response "Hiring both men and women," while 1 point is deducted for "Hiring only women" and "Hiring only men." In the event of the response "Differs depending on occupation and track," 1 point is awarded for the responses "Hiring both men and women and hiring only women," while 1 point is deducted for "Hiring both men and women and hiring only men," "Hiring both men and women, hiring only women, and hiring only men" and "Hiring only women and hiring only men." 0 points are awarded for "No hiring."
• Deployment status in personnel, general affairs and accounting posts • Deployment status in planning, surveying and public relations posts • Deployment status in research, development and design posts • Deployment status in information processing posts • Deployment status in sales posts • Deployment status in retail sales and service posts • Deployment status in production posts	1 point is awarded for "Deploying both men and women in all workplaces," while 1 point is deducted for "Have workplaces where only women are deployed" and "Have workplaces where only men are deployed," and 0 points are awarded for "No applicable divisions." (In the case of multiple responses, 1 point is deducted for responses consisting of "Have workplaces where only women are deployed" and "Have workplaces where only men are deployed," while 0 points are awarded for all other responses.)
• Implementation status of training for new staff • Implementation status of training for those in managerial posts (including those due to be appointed to such posts) • Implementation status of training to provide employees with the abilities required to perform their duties • Implementation status of training other than the above	1 point is awarded for "All education and training is conducted for both men and women," while 1 point is deducted for "Some training was conducted solely for women" and "Some training was conducted solely for men," and 0 points are awarded for "No applicable education or training was conducted." (In the case of multiple responses, 1 point is deducted for responses consisting of "Some training was conducted solely for women" and "Some training was conducted solely for men," while 0 points are awarded for all other responses.)
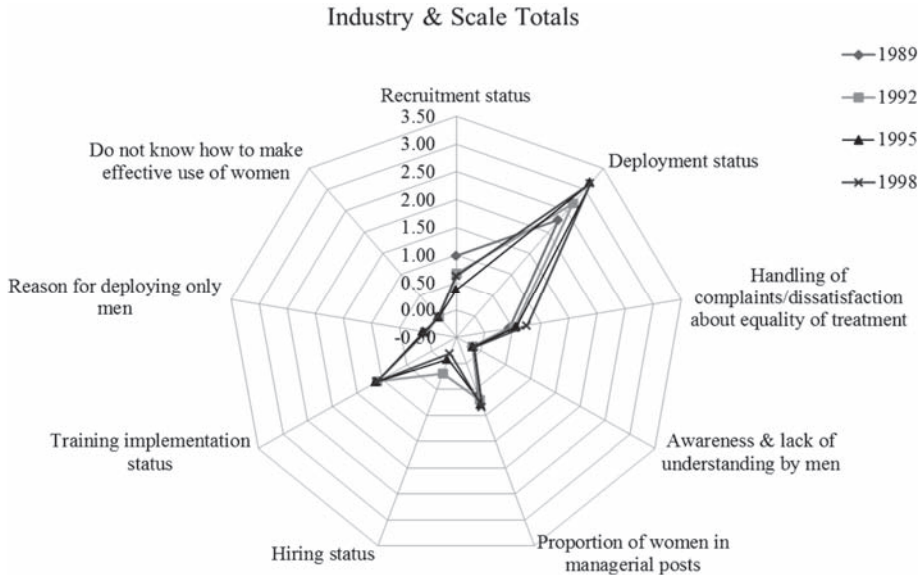
Figure 2. Changes in the EO Point Score

results, irrespective of industry or scale. To summarize, the surveys of companies show that equality progressed overall, at least during this period. Unfortunately, no analysis has been conducted since the revised Equality Act entered into force in 1999, but it is likely that this tendency has continued into the 21st century.

In the surveys of companies, it is possible that the responses show only the official stance, as they are completed by the person in charge of the personnel department, so the author would like to check the results by means of surveys of individuals, but there seem to be no surveys that systematically use the same questions. Let us look at the results of two surveys which have the same survey subjects (narrowed down to university graduates) and seven questions that are more or less the same: the 1991 Basic Survey on Women's Employment: Survey of Female Workers (Ministry of Labour) and the 1995 Survey of Female Workers Concerning Equal Employment Opportunities for Men and Women (Japan Institute of Workers' Evolution) (Wakisaka 2001b). Apart from the category "complaint or sexual harassment,"[5] equality was progressing in a positive direction in all areas. In particular, there was progress in equality in terms of the proportion of those seeking promotion and those who thought they would obtain it, the proportion of those obtaining the training and experience required for promotion, the proportion abiding by the "custom of resignation" (whereby women resign when they marry or have children), and the proportion of those with experience of workplace transfers that do not involve relocation.

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[5] The increase in sexual harassment and complaints about gender equality can also be interpreted as demonstrating progress in terms of equality, given that women no longer meekly accept such situations or are no longer oblivious to them.

Table 3. Workplaces of Female University Graduates

1991 N=2,578 (500 people or more)				1995 N=544			
		Has an atmosphere that makes it difficult to remain				Has an atmosphere that makes it difficult to remain	
		Yes	No			Yes	No	
Has a custom of resignation	Yes	24.9	30.3	55.2	Has a custom of resignation	Yes	17.1	19.5	36.6
	No	7.5	37.4	44.8		No	7.2	56.3	63.4
		32.4	67.7	100.0			24.3	75.7	100.0

Has a custom of resignation and an atmosphere that makes it difficult to remain, by scale of business establishment (1991) (Regular employees only)

	Workplace			
	(a)	(b)	(c)	(d)
Business establishment				
500 people or more	23.5	30.1	8.3	38.1
100-499 people	18.6	26.8	8.0	46.6
30-99 people	18.0	26.9	8.0	47.1

In light of this, let us now look at a cross tabulation of whether or not there is a "custom of resignation" and "an atmosphere that makes it difficult to remain" (when continuing to work even after marriage/childbirth, etc.) (Table 3). The proportion of workplaces that have neither a custom of resignation nor an atmosphere that makes it difficult to remain increased from 37% to 56%. The proportion with both fell from 25% to 17%. However, it is certainly the case that even in 1995, ten years after the Equality Act entered into force, 17% of female university graduates working at large corporations responded that it was difficult to work in their workplace unless one was unmarried.

The results of these company surveys and individual surveys unmistakably demonstrate that equality seems to have progressed since the Equality Act entered into force. One of the contributory factors behind this, from the perspective of human resource management, was the system of double-tracked personnel management.

3. Double-Tracked Personnel Management

The system of double-tracked personnel management was introduced around the time that the Equality Act was enacted, primarily at large corporations. The Equality Act stipulates that there must be no distinction between men and women in hiring, so companies created the two options of "*sogo-shoku*" and "*ippan-shoku*" at the point of hiring, with core jobs being classified as "*sogo-shoku*" and ancillary jobs being classified as "*ippan-shoku*." In addition, the *sogo-shoku* track was opened up to women, while men were also assigned to the *ippan-shoku* track. In order to cultivate the skills of capable women, those who intended to resign early were offered the *ippan-shoku* path, while those who intended to work

for many years were assigned to *sogo-shoku* posts. It would be fair to say that double-tracked personnel management was partly an attempt by companies to eliminate statistical discrimination.

Double-tracked personnel management as described here refers to the system of different occupational tracks. In practice, double-tracked personnel management is often also combined with such classifications as the place of employment and the potential for intra-company transfer. Typically, it is a category with a mixture of two elements, expressed as follows: "*sogo-shoku* consists of core posts that entail intra-company transfers" and "*ippan-shoku* consists of ancillary posts with no intra-company transfers." However, there is also a system of limited relocation, in which the content of the work is the same and posts are classified solely according to whether or not the employee is subject to intra-company transfers, so in order to avoid confusion, academically speaking, it would be better to refer to double-tracked personnel management as the "occupational track system." There is no potential for intra-company transfers at companies that have only one business establishment. However, the various statistics often do not distinguish between occupational track and whether or not there are intra-company transfers.

A detailed analysis of the reasons why companies have introduced double-tracked personnel management, based on survey responses by companies, is provided in Wakisaka (1996, 1997a). Approximately half of companies that had introduced such a system cited the reason for this as being "to respond to the Equality Act," but more than half cited "other reason(s)," specifically "to make effective use of women" and "to respond to increasingly diverse attitudes." When utilizing women in earnest, there are two types of situation. There are cases in which new female graduates are targeted and cases in which the focus is on existing female employees. In relation to new female graduates, in order to demolish statistical discrimination, whereby the investment in training is wasted if the company cultivates everyone in the same way, and therefore women can never be used effectively, companies respond to increasingly diverse attitudes among women by dividing them into the *sogo-shoku* staff category and the *ippan-shoku* category of those who are employed purely in support roles. Where the focus is on existing female employees, a path is established for them to switch from being utilized as *ippan-shoku* to being employed in *sogo-shoku* posts. At the risk of being repetitive, double-tracked personnel management has primarily been focused on large corporations. Even looking at the situation from 1995 to 2000, while 40–50% of enterprises with 1,000 or more employees had introduced such a system, only a few small-scale companies had done so. If the sole reason was to respond to the Equality Act, it would seem to be a good idea for small and medium-sized enterprises to introduce double-tracked personnel management as well.[6] Why have so many more large corporations

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[6] The reason why men and women are placed in the same staff category at small and medium-sized enterprises is likely to be either that the company is actually making effective use of women or that the company has no interest in the human resource management of women and it is just too troublesome to use separate staff categories.

Table 4. Separation Rates by Scale and Gender

Scale	Male (M)	Female (F)	F/M
1000–	14.1%	41.5%	2.94
300–999	13.4%	33.3%	2.49
100–299	18.3%	34.0%	1.86
30–99	15.6%	30.2%	1.94
5–29	16.1%	27.0%	1.68
Total	15.3%	31.8%	2.08

Source: Ministry of Health, Labour and Welfare, *Survey on Employment Trends 2009*.

Note: General workers.

Separation rate = Number of workers leaving posts/number of workers as of January 1, 2009.

introduced double-tracked personnel management? The reason is thought to be related to the behavior of employees in leaving their jobs, as outlined below.

To see the reasons why large corporations often use double-tracked personnel management, it is helpful to look at the separation rate by establishment size.[7] Let us look at Table 4, which summarizes the 2009 Survey on Employment Trends. Companies are interested in disparities between men and women, and looking at the separation rates for men and women, there is a big disparity between them at large corporations. Consequently, there is an incentive for such companies to separate their occupational tracks.[8]

With regard to the hiring of new female graduates, according to studies carried out hitherto, there is a considerable mismatch in terms of the vocational awareness of women in *sogo-shoku* positions, even at the hiring stage, and, above all, many change their minds along the way. For example, let us look at a study conducted by the author in which he has tabulated a survey especially for this purpose. Looking at the situation seven years after graduation in relation to women who graduated from university in 1987, the largest number of women thoroughly settled in their jobs was accounted for by those in *sogo-shoku* positions, but it is not the case that they were decisively more numerous compared with companies

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[7] More precisely, it is better to use the voluntary separation rate (quit rate), which excludes those who leave their jobs due to management circumstances. The quit rate for 1991 is known and is analyzed in Wakisaka (1997a). It is not possible to extract this information alone from the data for the 2000s, so the separation rates for both men and women are compared in Table 4. They have been calculated for 2002, 2005 and 2008, and all demonstrate the same tendency as seen in the figures for 2009.

[8] According to the 2010 Survey of Gender Equality in Employment Management, whereas 31.2% of companies with at least 1,000 employees felt the fact "the length of continuous service of women is short on average" to be a problem in promoting greater participation by women, this became less of a problem as the scale of the company decreased, with 24.0% of companies with 30–99 employees and 19.5% of companies with 10–29 employees stating that this was an issue for them.
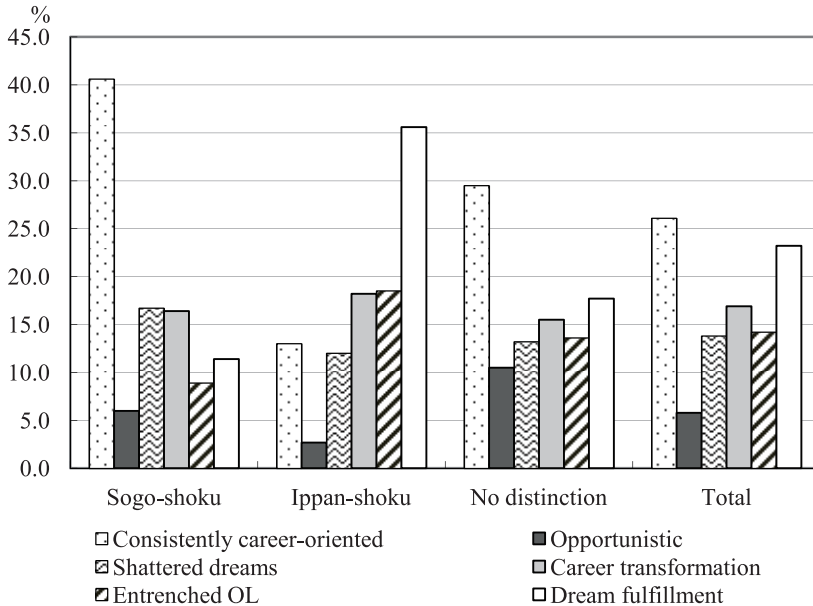
Note: Classified into 6 categories according to change between job-seeking activities based on desire to continue working and current situation. Wish to work long term includes those who responded "for as long as possible" and "until the mandatory retirement age." Wish to work short term includes those who responded "for as short a time as possible," "until marriage" and "until childbirth."

• Consistently career-oriented: Wish to work long term → Wish to work long term
• Opportunistic: Wish to work long term → Wish to work short term
• Shattered dreams: Wish to work long term → Not employed
• Career transformation: Wish to work short term → Wish to work long term
• Entrenched OL: Wish to work short term → Wish to work short term
• Dream fulfillment: Wish to work short term → Not employed

Figure 3. Changes among Women Who Graduated from University in 1987

without a track-based system. Moreover, in the case of *ippan-shoku* as well, quite a few women had become or were becoming settled in their jobs. Looking at changes in career orientation by type, comparing the situation before finding employment and the situation seven years later (Figure 3), one can see that the attitudes of many women have changed, irrespective of whether they are in *sogo-shoku* or *ippan-shoku* posts. Double-tracked personnel management has the flaw that it cannot respond to this kind of situation. (Wakisaka 1996, 1997a)

4. The Career Break System for Women

The 1985 Equality Act had mechanisms designed to make it possible to guarantee the effectiveness of gender equality (Ministry of Labour Women's Bureau 1986). These were provisions aimed at achieving a balance between family responsibilities and working life; as well as provisions carried over from the Working Women's Welfare Law, such as the child care leave system examined in Part 4, the act also prescribed a new system called the career break system for women, providing for "skills development to support re-employment" in Article 24 and "special measures for re-employment, etc." in Article 25. This imposed on employers the obligation to make efforts to implement a career break system for women, aimed at "women who had resigned due to pregnancy, childbirth, or child rearing."[9] The origins of the career break system for women can be traced back to the 1970s. In the latter half of the 1970s, following the oil crises, a system for opening the way for women who had resigned their posts to be re-employed became the focus of attention as a means of improving morale among existing female staff members, based on the concept of making effective use of women's skills in a way that is tailored to their life-cycle.

However, until the 1985 survey, the rate of introduction of this system was less than 10%. Subsequently, due to the efforts of the government to increase the prevalence of the system, against the background of the entry into force of the Equality Act, the 1988 survey showed that the rate had increased to 17%, but it leveled off in the 1990s and subsequently remained around the 20% level (Sato 2001). The enactment of the Childcare Leave Act and the popularization of the child care leave system were cited as the main reasons why introduction of the system leveled off.

But was this really the case? Looking at the results of analysis based on special tabulation of the 1996 Basic Survey on Women's Employment Management, there are no signs that the introduction of the child care leave system gave rise to a reduction in the rate of introduction of the re-employment system. Indeed, there was actually found to be a complementary relationship between the two systems. If one controls for such factors as the industry dummy, number of employees, proportion of women, and whether or not there is a labor union, there is a significant positive relationship at the 1% level between the child care leave system and the career break system (Career Break System Study Group 1998; Wakisaka 1998b). Moreover, looking at those using the systems at business establishments that have these systems, one can see that business establishments which have more users of the career break system than users of child care leave account for a quarter of the total, so it is certainly not the case that the career break system has been entirely replaced by child care leave.

So what is the complementary relationship in terms of the differences between these two systems? Sato (2001) cites two characteristics of the career break system. One is the

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[9] Incidentally, long-term nursing care was added in the 1995 revision, and the scope was extended to include men as well.

fact that it makes it possible to make effective use of the careers of employees who have to resign for some time due to family responsibilities or other reasons. Using former employees rather than relying on the mid-career employment market enables companies to obtain more accurate information. The second is that, while the introduction of leave not only for child rearing, but also for such purposes as providing long-term nursing care, volunteer activities, or education and training is not possible because there is a risk that the design of institutional arrangements will lose its flexibility, the career break system has the advantage that it can be introduced even if it is unclear when the employee will return. Thus, the child care leave system and the career break system can both be introduced, based on differences in the employees that they target and differences in the reasons for making use of these systems.

Incidentally, the introduction rate of the career break system was 20.7% in the 1996 survey, but by the time of the 2008 one, it had been introduced at 29.9% of business establishments (Ministry of Health, Labour and Welfare, Survey of Gender Equality in Employment Management).

III. Family-Friendly Policy

If one considers that there are differences between the two groups in terms of latent ability and variation in the degree to which they become settled in their jobs, the measures that should form the basis for dismantling statistical discrimination are measures aimed at eliminating those differences. In the case of sexual discrimination, there is believed to be no difference in ability between men and women, so the government implements measures to support continuing employment of women, in order to ensure that the degree to which they become settled in their jobs reaches the same level as that for men. More specifically, these include such support measures as making it easier to take leave for the purposes of child rearing or long-term nursing care and providing subsidies for the development of nurseries for infants and young children. These measures form the path toward overcoming statistical discrimination, which is the root of modern discrimination.

While the government indicates the general direction that it wishes companies to take, it does not itself implement specific measures. Companies that voluntarily implement measures are known as "family-friendly" companies. These are companies that aim to enable employees to demonstrate their abilities, thereby improving productivity, by implementing measures that take employees' family responsibilities into consideration.

The "family-friendly" concept began to be propounded by international organizations at the end of the 1970s, in connection with the equality of employment opportunities for men and women, and gradually spread throughout the EU (EC) and the USA. The background to the emergence of the "family-friendly" concept is the same in Japan as well, and in 1999, the then Ministry of Labour held the first Family-Friendly Companies Awards (Women's Bureau, Ministry of Labour 1999). Family-friendliness began to become a cor-

nerstone of human resource management at the end of the 20th century and subsequently evolved into measures to promote a better work-life balance (WLB).

Family-friendly measures and equality measures in both Japan and the USA have become a corporate strategy aimed at improving productivity, at least in the long term. This is because taking such measures (as opposed to not taking them) entails the possibility that companies will hire and make effective use of good employees and that employee performance will improve as a result. Studies showing that measures aimed at achieving compatibility between work and family life increased productivity were carried out first in the USA and the UK, with a body of research on this topic later being accumulated in Japan as well.[10]

Looking at the results obtained by assigning scores for the level of family-friendliness (FF points), compiled in the same way as the EO points in Section II–2, large-scale business establishments, the electricity, gas, heat, and water supply sector, and the finance and insurance sector had high scores, while small-scale business establishments and the construction sector had low scores. This FF point score takes into consideration not only whether or not these systems exist, but also what the utilization rate of each type of family-friendly system was during the 1990s; many business establishments scored zero, because nobody was using the systems. The scoring system gave large corporations an advantage, as there is a strong likelihood of various family-friendly systems being required at large corporations, which have many employees.

Looking at the situation by industry, although at first glance the results appear to be the same for the EO point and FF point scores, closer scrutiny reveals differences between them. Although the electricity, gas, heat, and water supply sector emerges as the top sector by a long way in terms of the family-friendliness index, it is only just above average in terms of the equality index. Moreover, while the family-friendliness index scores for the wholesale and retail sector, catering establishments, the real estate sector and the service industry are just about average, these sectors receive high scores in the equality index.[11]

IV. The Importance of the Child Care Leave System

1. The System and Its Use

The child care leave system is a key point in situations in which women's (and men's) career development is interspersed with time spent bringing up children; it tests the very essence of family-friendly companies and is also an important part of WLB measures.

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[10] Matsubara and Wakisaka (2005, 2006a, 2006b) provide summaries of the status of such studies up to around 2005. Subsequently, numerous studies were published in Japan as well, including the Economic and Social Research Institute, Cabinet Office (2009), Sato and Takeishi (2008), and Yamamoto and Matsuura (2011).

[11] Wakisaka (2001a) made it easier to obtain information by using the EO and FF point scores to analyze the situation.

However, as it has come to be perceived as entailing high costs for companies,[12] child care leave did not become prevalent at workplaces until the Childcare Leave Act entered into force in 1992. Looking at transitions in the popularization of the child care leave system, it became prevalent at quite a few business establishments, due in part to the influence of the Childcare Leave Act that entered into force in 1992 and the revised Child Care and Family Care Leave Act of 1999. As of 2010, 68.3% of business establishments had a child care leave system (at business establishments with at least five employees; the proportion was 90.0% among those with at least 30 employees). Larger business establishments are more likely to have this system, and it was in place among all business establishments with at least 500 employees.

Looking at the results for fiscal 1996, for which a special tabulation has been compiled focusing on the differences in child care leave take-up rate according to whether or not the company has a child care leave system, there is a considerable difference between the two, with a take-up rate of 68.2% among companies with such a system, and 37.2% among those without. Thus, one can see that although it is not the case that it is completely impossible to take child care leave without a system in place, it is much easier to take it if such a system exists. Even in more rigorous analysis, it is clear from the author's research that the existence of a child care leave system increases the child care leave utilization rate (Wakisaka 2001a).

The child care leave utilization rate (number of women taking child care leave/number of women giving birth) has risen rapidly, increasing from 49.1% in 1996 to 70.6% in 2004, and reaching 83.7% (at business establishments with at least five employees) in 2010. The utilization rate among men is low, but it has risen sharply from 0.12% in 1996 to 1.38% in 2010.[13] However, only the proportion of women making use of child care leave and continuing to work has increased, while there has been no change in the proportion of women continuing to work after marriage/childbirth (proportion continuing their employment) (Figure 4), so the female labor force participation rate by age is still an M-shaped curve (Figure 5). The reason why the proportion continuing their employment remains unchanged even though the female child care leave take-up rate is rising is that 70–80% of women resign before becoming pregnant or giving birth.[14]

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[12] As it is a system of unpaid leave, there are no labor costs involved. Social insurance premiums are also waived basically in most cases. The main cost relates to finding someone to take over the duties of the person on leave, but this is the same whether an employee is absent from work or resigns.

[13] For further details concerning child care leave for men, see Sato and Takeishi (2004), as well as Wakisaka (2010).

[14] Consequently, in Wakisaka (2001a), the number of female employees is used as the denominator for the child care leave utilization rate, rather than the number of women giving birth.
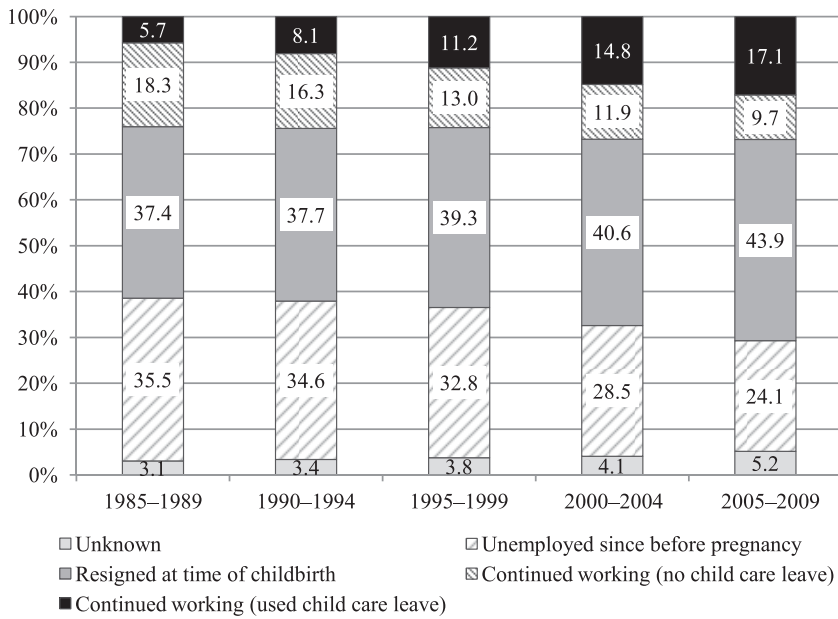
Figure 4. Employment Status at the Time of the Birth of Their First Child among Women with Experience of Working before Giving Birth (by Year of Childbirth).
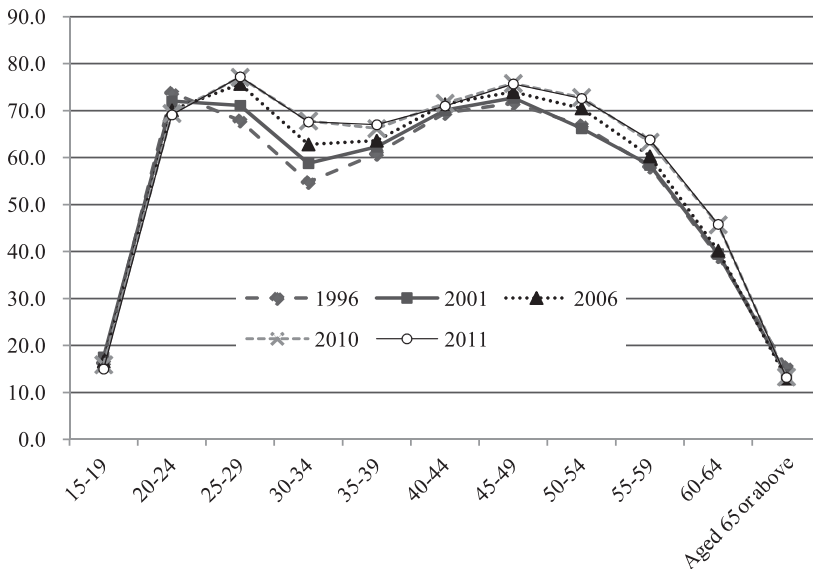
Figure 5. Women's Labor Force Participation Rate by Age Group

2. The Issue of Replacement Personnel

The challenges that arise from child care leave are (i) replacement personnel, (ii) income while on leave, and (iii) the deterioration of skill while on leave. According to a survey conducted in 2000 by the Japan Association for the Advancement of Working Women, "difficulty in securing replacement personnel" and "handling of replacement personnel after the original staff member returns to the workplace" were the main problems, accounting for 40–50% of responses. The second problem is in the process of being resolved. From April 1995, employment insurance paid a benefit equivalent to 25% of the wages of those taking child care leave; this figure was increased to 40% in 2001 and 50% (provisionally) from 2007.

Let us look at the first problem. What is done about replacement personnel in workplaces with people using child care leave? The examples of replacement personnel utilized hitherto during child care leave—including that taken by the author himself—can be broadly classified into the "Share Method" and the "Forward Rotation Method (Domino Method)."[15]

The method that involves sharing the work with the individual's colleagues and increasing each person's workload by small amount is called the Share Method. When the individual concerned returns to work, the situation returns to normal. The other involves serial movements of employees when a staff member takes leave. Let us call this the Forward Rotation Method. If a woman takes child care leave, the man or woman doing the next-easiest work to her is assigned her job to do. The original work of her successor is then assigned to the person doing the next-easiest work. In other words, in this workplace, each person is transferred in sequence to doing more advanced work. That is how this method works.

In order to gain a better understanding of the crucial issues of leave and making up for the absence of a staff member, let us look at the advantages and disadvantages of the Share Method and the Forward Rotation Method. The Share Method involves more intense labor if the workplace has only a few personnel among whom the work can be shared, so

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[15] See Wakisaka (2002). Although not numerous, there are two kinds of case that do not fall into either category. One is the method used at one company that provides a service delivering semi-prepared side dishes to people's homes. It constantly maintains personnel who are not out on deliveries, in order to deal with staff members' needs in relation to their children, for example. This is similar to the so-called "relief staff" or "utility staff" workers found at production sites. Accordingly, let us call this the "Relief Staff Method." It is necessary for these relief staff to be thoroughly conversant with all matters, such as the various routes used by each of the staff members delivering to a certain region. This is a job that can be done only by workers with a certain level of experience and knowledge. The other involves a situation that is the reverse of the Forward Rotation Method (Domino Method). In the construction industry, for example, it is often the case that one cannot do a job unless one has an official qualification. Consequently, in the construction industry, which has a particularly large number of small and medium-sized enterprises, when a staff member with an official qualification takes child care leave, if none of the people below him/her have that qualification, it will become necessary for that person's boss to do the work of the person taking child care leave.

having a certain number of people is a prerequisite. The conditions for the smooth implementation of this method are the fulfillment of this prerequisite and staff members helping each other out in the course of their work under normal circumstances. If there is an awareness that "it could be me," with staff members thinking that they might have to take time off work for child rearing or long-term nursing care purposes one day, this will go even more smoothly, but one cannot expect employees with no prospects or plans for taking such leave to think this way. Consequently, although it is a good method for maintaining (or improving) productivity in the short term, there is little potential for it to lead to productivity improvements in the medium to long term.

The Forward Rotation Method accepts a minimum level of productivity decline in the short term (because workers are appointed to jobs to which they are unaccustomed), but aims for long-term improvements in workplace productivity. Looking at the situation in terms of its employee career development and skills development aspects, this is a good training opportunity because taking leave triggers the appointment of staff to more highly-skilled jobs. In order for this to work smoothly, it is important for the company or workplace to have at least a broad framework for a career path.

A survey conducted by the Economic and Social Research Institute, Cabinet Office and the Research Institute of Economy, Trade and Industry compared responses to those taking leave for at least six months in Japan, the UK and Germany. "Adjustment of the working hours of existing permanent employees" was the most common response adopted in Japan, cited by 47–51% of respondents. This was followed by "Revision of the content of duties based on existing staffing levels" at 32–34%, and "Adjustment based on interdepartmental transfer of permanent employees" at 31–33%. "Revision of the workload based on existing staffing levels" was in fourth place, at 23–27%. In contrast, in both Germany and the UK, "Revision of the workload" was top, at 41–54%.

3. The Deterioration of Skills While on Leave and Assessment of Staff on Leave

There is the question of the kind of disadvantages that taking leave can entail for the individual in question. Answering this question will enable us to understand the fundamental reasons why more men do not take child care leave.

One reason is the risk that the skills of the individual concerned will decline and become outdated while on leave. This is because this issue has an impact on the individual's subsequent career. It differs depending on the occupation, but the question of how long a leave period—that is to say, how big a gap—has an adverse impact on one's career is an important issue, both in research and practical terms. What is even more important than that is how to prevent this happening. The measures taken to avoid being behind the times include sending the individual concerned the company newsletter at regular intervals. However, a more crucial measure is perhaps to send them various communications and information from their colleagues and bosses.

Table 5. Assessment Method Used for Those Taking Child Care Leave
and Their Assessment Results

| | Assessment results of those taking child care leave | | | |
	Above average	About average	Below average	Total
Conduct assessments of performance during the period after returning to work	6 4.7%	90 70.9%	31 24.4%	127 100.0%
Conduct assessments of performance during the whole period, including the period of leave	0 0.0%	30 31.3%	66 68.8%	96 100.0%
Conduct assessments based on ability at the current point in time	6 8.8%	52 76.5%	10 14.7%	68 100.0%
Use the mean value for all staff	0 0.0%	7 100.0%	0 0.0%	7 100.0%
Use the assessment immediately before they took leave	0 0.0%	12 75.0%	4 25.0%	16 100.0%
Use the lowest assessment score for the period of leave	0 0.0%	0 0.0%	25 100.0%	25 100.0%
Other	0 0.0%	7 46.7%	8 53.3%	15 100.0%
Total	12 3.1%	223 57.8%	151 39.1%	386 100.0%

According to a 2006 survey of members of the Japanese Electrical Electronic & Information Union (JEIU), 64.1% received company newsletters, 12.1% information from bosses, and 52.2% communications from colleagues.[16] However, the figures differ between the survey of those in managerial posts and the survey of individuals, so there is a possibility that information is not necessarily being shared.[17]

What is important from the perspective of the impact on an employee's career is

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[16] In the results concerning a question about the support that 504 people who had returned from child care leave had received during their time away from work, 17.5% responded that they had received no particular support. However, it must be borne in mind that this was a sample that contained many companies with a history of providing child care leave under the umbrella of the JEIU.

[17] In the 2006 survey by the JEIU, the same questions were asked of union members who had returned to work after taking child care leave and those in managerial posts at the time of their return, so it provides valuable matched data. In terms of the things that 501 bosses of those who had taken child care leave had done during the leave period, 29.3% responded that they had "provided regular information about the company and/or work."

whether or not the period of leave is subject to assessment. Logic would suggest that this period should not be subject to such assessment, as the individual is not working, but there are quite a few cases in which it is included, due to the mechanical operation of the assessment system and distorted performance-based assessment. Let us compare the results of assessment of subordinates by managers who do include the leave period in the assessment and assessment by those who do not. As is evident from the results shown in Table 5, the assessments by managers who do not include the leave period in their appraisals are higher. Only managers who stated that they "conduct assessments based on skill at the current point in time" or "conduct assessments for the period after returning to work" gave assessment scores that were higher than average. On the other hand, 68.8%―over two-thirds―of managers who conducted assessments that included the leave period gave lower assessment scores than average.

V. Short-Time Work: Workload, Job Content and Assessment

Based on the same 2006 survey by the JEIU, let us look at the work done by 216 people (mainly women) who were doing short-time work after returning to work following child care leave. The survey asked about whether the content of each respondent's work had changed or was the same, compared to the situation before taking child care leave, and whether the workload was the same or had decreased. Looking at the results, 94 responded that their workload had decreased, fewer than the 103 who responded that it had not changed. 106 responded that the content of their work remained unchanged, which suggests that work content had changed in many cases.

Let us look at the relationship between the content of employees' work, their workload, and assessment. Those who responded that "the content of my work has changed, but the workload is the same" compared with the situation before taking child care leave obtained the best assessment scores. The reason for this is unknown. The next-highest scores were obtained by those who responded "the content of my work is the same, but my workload has decreased."

Next, let us examine the relationship between the method of assessment used for short-time workers and the actual assessment results (Table 6). In all eight cases in which the employees had obtained higher assessment scores than the average for that workplace, their boss had carried out "assessment based on performance per hour worked." Bosses who rated "less flexibility," "easier content" and "reduced workload" negatively also gave lower scores in the actual assessment. The method and operation of assessments of this short-time work system for child rearing is a crucial issue to be tackled when seeking to popularize the short-time regular employee system in areas other than child rearing and long-term nursing care. According to the 2010 Survey of Gender Equality in Employment Management, 13.4% of business establishments employed short-time regular employees, and there was not a great difference in terms of scale between the proportions of business establishments

Table 6. Assessment Methods and Assessment Results for Short-Time Workers

	Above average	About average	Below average	Total
Assessment based on performance per hour worked	8 7.1%	73 64.6%	32 28.3%	113 100.0%
Having less flexibility is rated negatively	0 0.0%	12 54.5%	10 45.5%	22 100.0%
Having easier work content is rated negatively	0 0.0%	0 0.0%	6 100.0%	6 100.0%
Having a reduced workload is rated negatively	0 0.0%	10 45.5%	12 54.5%	22 100.0%
Other	0 8.0%	11 128.0%	6 73.0%	17 207.0%
Total	3.3%	60.3%	35.3%	100.0%

employing such workers.[18]

VI. Conclusion

Looking at the history of the human resource management of women, the use of part-time workers and WLB measures have developed an increasingly important relationship in recent years. It has not been possible to expand upon this here, due to space constraints, but many studies of this topic have been carried out, including by the author (Wakisaka 1997c; Wakisaka and Matsubara 2003; Gakushuin University Research Institute for Economics and Management 2008, etc.). In the future, the former will be relevant not only to women, but also to casual work by men and short-time work by elderly people, while the latter will be relevant to reforms of men's working style. Consequently, it seems likely that the human resource management of all workers, including men, will progress along a similar path to that along which the human resource management of women has already traveled.

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[18] Matsubara (2004, 2012) contains detailed descriptions of the short-time regular employee system. In addition, the Ministry of Health, Labour and Welfare website carries the Support Guide for the Introduction of the Short-Time Regular Employee System, which provides a detailed guide to business cases and key points to bear in mind when introducing such a system.

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An International Comparison of Gender Equality: Why Is the Japanese Gender Gap So Persistent? [*]

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When it comes to gender equality, Japan lags behind other advanced countries despite the introduction of Equal Employment Opportunity Act in 1985. This article discusses institutional conditions that promote gender quality in the market place, and shows those conditions are largely lacking in Japan. Generally speaking, many consider Scandinavian countries as vanguards of gender equality. These countries have adopted extensive policy support enabling mothers to balance work and family. This article argues that mother-friendly policies are not the only factors that explain the relative economic position of men and women. It uses the US and Spain in order to highlight different institutional scenarios to promote gender equality. The economic position of Spanish women used to be as low as that in Japan. More specifically, this article discusses the equalizing effects of the following institutional conditions: (i) strong anti-discrimination laws matched with class action suits, (ii) the presence of professionally-oriented educational systems that allow women with academic abilities entry into high status occupations; (iii) market conditions that enable women to outsource their unpaid domestic work; and (iv) availability of contraceptive methods that give women control over their reproductive decisions.

I.   Introduction

A quarter-century has passed since the enactment of the 1985 Equal Employment Opportunity Act in Japan. The economic status of Japanese women, however, remains well below average as compared with women in other developed nations as the recent gender report published by OECD highlighted (OECD 2012). This paper conducts an international comparison to examine the problems with the employment environment for women in Japan and the efforts taken to address them.

II.   Gender Equality in Employment in the Developed Nations

Different measurements are used to capture the degree of gender equality in employment. By any measure, women's social progress in Japan has lagged far behind other nations.

Figure 1 compares the employment rates of women in advanced industrial countries. The columns to the left show the employment rates of women aged 25 to 49, while the columns to the right show the employment rates of mothers who have children under the age of
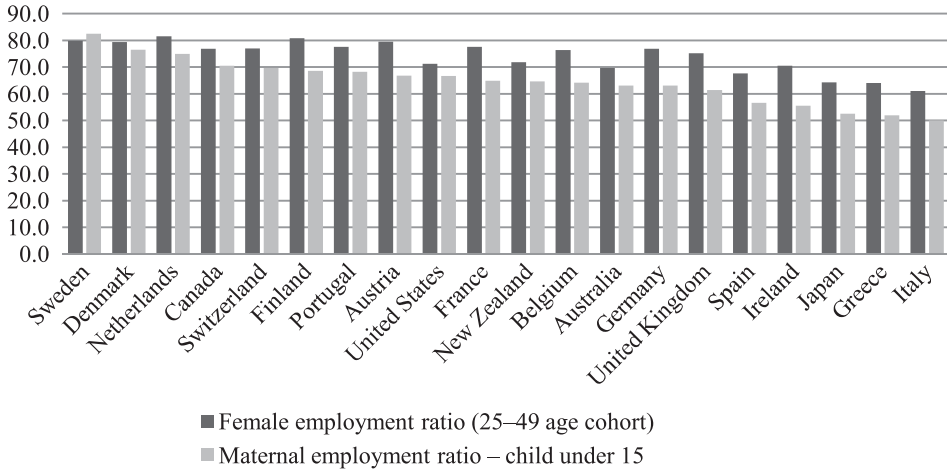
Figure 1. Maternal Employment Rates (%)

15. This figure shows that Japan has the lowest employment rates of women/mothers, on par with the countries of southern Europe.[1]

Next, let us look at the wage gap between men and women who work full time. Figure 2 shows gender wage gap (how much more men earn relative to women) among men and women in the bottom and top quintiles of wage distribution in respective countries.

Let us examine the overall trend in gender wage gap first. Japan and South Korea stand out for their large gender gaps. Surprisingly, the gender wage gaps are very small in Southern European countries—despite that fact that they resemble East Asian countries such as Japan and South Korea in their low female employment rates (as shown in Figure 1). The US, Australia, New Zealand, France, and Nordic countries (with the exception of Denmark) demonstrate an interesting pattern. These countries have small gender gaps among men and women in the bottom quintile, but big gaps among men and women in the top quintile. In fact, the gender wage gap among high earners in this group of countries is as large as in Japan and South Korea. This pattern—that is much bigger gender gap among high earners—suggests that occupations and workplaces that offer high wages are still largely dominated by men. It is important to emphasize that this trend is evident in Nordic countries, which have a strong reputation for gender equality. Finally, Germany, Austria, Canada, the Netherlands, Denmark, and Belgium demonstrate a more uniform pattern of gender wage gap. In these countries, the magnitude of gender wage gap does not change by

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[1] Public childcare services are not very developed in the English-speaking regions of Canada, but are quite heavily developed in the Quebec and French-speaking areas. In countries like Germany, Switzerland, and Belgium where policy responsibilities are decentralized, the rates of development of public childcare differ significantly across municipalities and regions even within the same country.
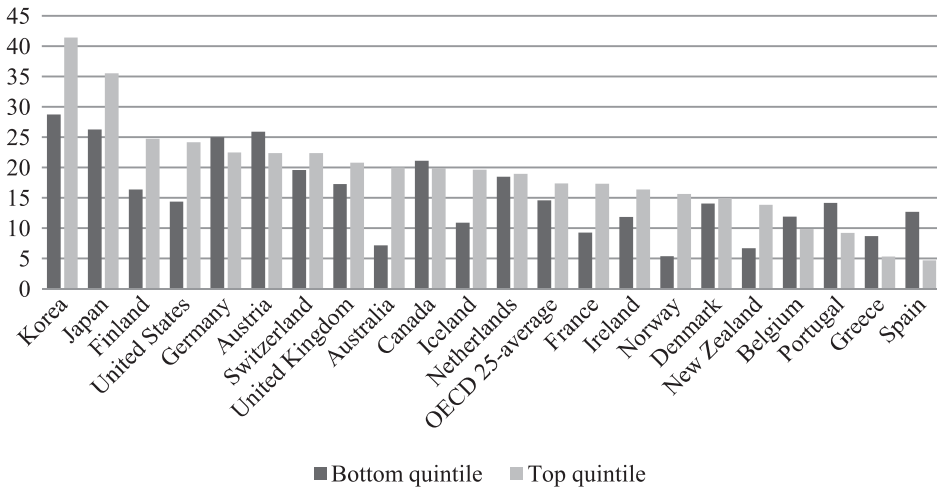
Source: OECD Family Database online (2011), Chart LMF1.5.B.

Figure 2. Gender Gap in Full-Time Earnings at the Top and Bottom
of the Earnings Distribution (%), 2008

quintiles.

Scholars explain the presence of gender wage gap in terms of factors such as discrimination against women, differences in human capital (education and experience) and occupational segregation by sex (Mincer and Polachek 1974; Charles and Grusky 2004; Charles et al. 2001). Although Figure 2 does not control for these kinds of personal attributes, the OECD data on the length of enterprise tenure (a proxy for work experience) and female enrolment rates in tertiary education show that Japan lags behind other advanced industrial countries.[2]

Occupational segregation by sex can be measured in different ways, and a number of indices exist. Here, I will look at two simple measures of female advancement into selected high status occupations traditionally dominated by men: (i) the proportion of women in upper-level occupations (corporate managers, top government leaders, and politicians, Figure 3); and (ii) the proportion of women in professional occupations, such as researchers (Figure 4).

In Japan, the proportion of women in such positions is extremely low. In contrast, English-speaking countries like the US, and Nordic countries score very high on women's social advancement by most measures. It is worth noting that women in English-speaking countries enjoy a higher status than women in Nordic countries—countries renowned for their commitment to gender equality and generous family-work reconciliation policies

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[2] In advanced industrial countries, the rate of university advancement among women has long been higher than that among men, but in Japan, the number of male university students still exceeds the number of female students (see *OECD Education at a Glance* for each year).
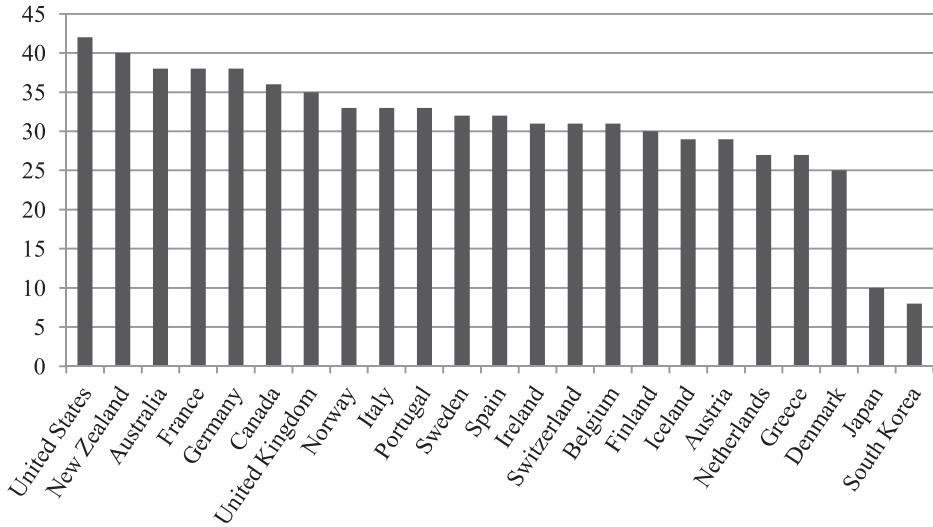
Source: United Nations Development Program, *Human Development Report 2008.*

Figure 3. Ratio of Women in Managers, Government Officials and Politicians (%)
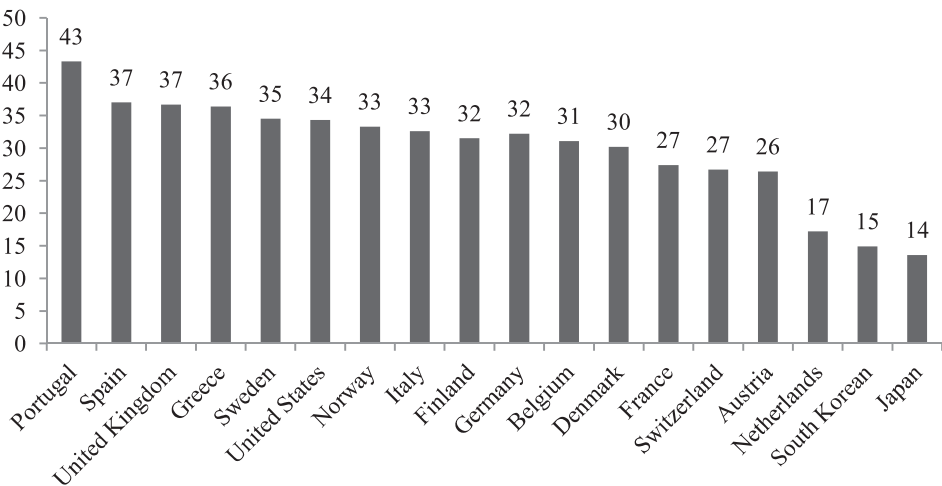
Source: Cabinet Office (2011, figure 35).

Figure 4. Ratio of Women among Researchers/Scientists (%)

(Figure 3). From a Japanese perspective, the situations in those countries may seem too good to be true, but even in the gender-equality superpowers like Sweden, there are invisible barriers preventing the upward mobility of women (Henrekson and Tenkula 2009). In a later section, I discuss possible reasons for this in relation to the gender gap in the higher wage bracket, mentioned earlier.

Figures 1 to 4 reveal an interesting contrast between Japan and Spain, which cannot be explained by the prevailing theories of gender inequality. Spain resembles Japan in its strong *familialism* and its low rate of female labor participation (as shown in Figure 1). In the 1980s, Spain, like Japan, was trailing the other advanced industrial countries in various measures of gender equality. Social welfare systems and labor market conditions worked to the disadvantage of women in both countries. The two had also been similar in the labor market rigidity (particularly for full-time regular employment), their long working hours, their low male participation rates in housework, and their under-developed public childcare services. However, when we compare these two countries today, we find that the ratio of women in research positions in Spain so much higher than Japan (Figure 4), and the ratio of women working as politicians or in management positions is three times higher in Spain than in Japan (Figure 3). Spain has long had a lower gender wage gap than Japan, and unlike Japan, has an extremely low gender gap in the top quintile of the national wage distribution (Figure 2). Why have women in Spain been able to attain higher status than they have in Japan, given both countries' disadvantageous institutional conditions? This is an important question that will be discussed in the next section.

Various kinds of institutions and policies help promote equality of opportunity in the labor market. Family-work reconciliation policies that facilitate women's access to work promote equality by offering the "carrot" (incentive). Laws that prohibit gender discrimination promote equality by using the "stick" (punishment such as penalties for infractions). Gender-neutral tax and social welfare systems, characteristics of the labor market, approaches to education and occupational training are all relevant institutions and policies that shape the overall gender environment. In the next section I will examine which institutional conditions are most effective by contrasting the US gender-equality strategy against the Nordic strategy.

III. The Swedish Scenario: Incentive-Driven Policies to Promote the Employment of Mothers

Sweden remained neutral during World War II. As a result, not only was Sweden spared the wartime devastation that the rest of Europe experienced, but benefitted greatly from the postwar reconstruction boom in Europe. Swedish exports of steel and other goods increased. The labor shortage that resulted from the postwar economic boom was initially met by immigrant labor. However, the government quickly shifted to the new policy of mobilizing native married women into the work force. In order to mobilize married women, the government expanded the supply of public childcare services in the 1960s. The government also reformed the tax system in the 1970s from a household-based taxation to an individual-based taxation. The new individual-based taxation removed tax penalties against second earners within the household (typically wives). During the same period, the childcare leave program was introduced to allow parents to take time off work without being laid off. From
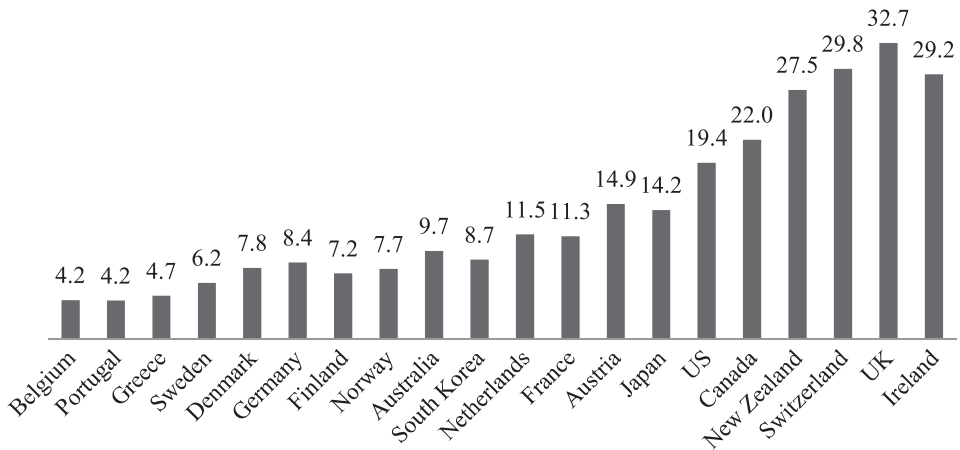
Source: OECD Family Database online (2011), Chart PF3.4.B.

Figure 5. Net Childcare Costs for a Dual Earner Family with Full-Time
Arrangements of 167% of the Average Wage, 2004

the very beginning, fathers had the same rights as mothers to take time off to care for chil-
dren. The government has since guaranteed childcare as well as elder care as rights of Swe-
dish citizens.

Sweden (and Nordic countries, more generally) is known for promoting the employ-
ment of women, as well as for creating an environment where it is easy for women to have
children. Unlike in Japan, family work reconciliation policies are fully developed in Sweden.
The common pattern is for children to be cared for in the home by their mothers and fathers
during their first year, after which time they are enrolled in a childcare facility so that par-
ents can return to work. The government guarantees the availability of public childcare for
all children. Flexible working hours also help parents reconcile family and work. Many
mothers engage in part-time work while their children are very young. Part-time work in
Sweden differs from part-time work in Japan. In Japan, part-time work has always been
used to employ housewives cheaply by paying them at a much lower wage rate and offering
few benefits (Brinton 1994). In Sweden, in contrast, the same work is performed for the
same wages; it is only the mother's work hours that are reduced. It is also easy for employ-
ees to transition from part-time work to full-time work (Kenjoh 2005).

Figures 5 and 6 compare the policies adopted in northern Europe and Japan to support
working mothers.

Figure 5 compares childcare costs in advanced industrial countries. The ratio of
childcare costs relative to the household earnings is calculated for a dual-earner household
with the joint earnings of 167% of the average wage. The share tends to be higher overall in
English-speaking countries that do not have public childcare centers and lower in Nordic
countries that provide affordable public childcare. It should be noted that the costs are low
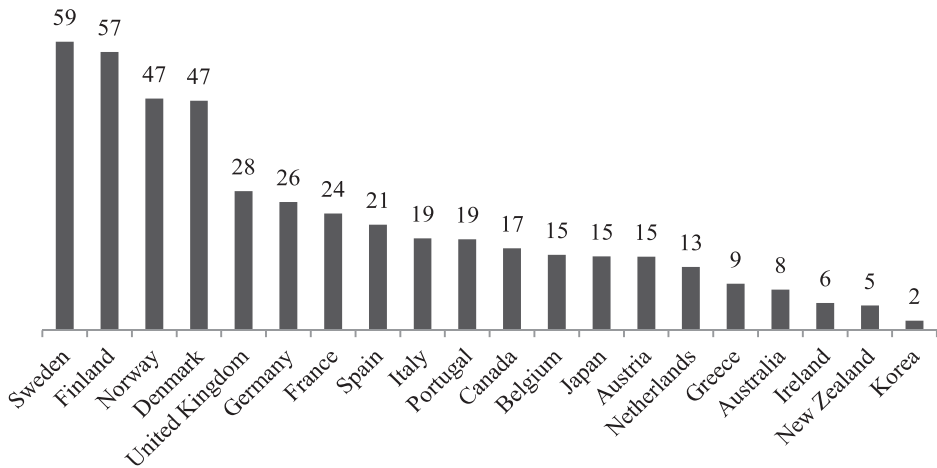
Source: OECD Family Database online (2011), Chart PF2.1.B.

Figure 6. Spending on Maternity and Parental Leave Payments per Child Born, 2007
(Spending per Birth as a % of GDP per Capita)

even in Portugal and Greece, which do not have public childcare centers. Greece has a low female employment rate, but Portugal has an extremely high ratio of female full-time employment, putting it in line with the other countries of southern Europe. It is interesting to note that in English-speaking countries that have long had even higher childcare costs than Japan, the employment rate of mothers is a great deal higher than in Japan.

Figure 6 compares governmental spending on maternity and parental leave payments per child born in a year as a ratio of GDP per capita. This ratio will be higher in countries that offer higher rates of guaranteed income and have larger numbers of people who take advantage of their leave benefits. Unlike Nordic countries, which provide generous benefits to parents on leave nearing 80% of pre-leave wages, Japan offered no more than 30% until 2010 (with a further 10% after they return to work when their leave has ended). Moreover, in Japan, part-time workers are not eligible for any childcare leave allowance, even though one might legally expect them to be eligible. Ultimately, the childcare leave expenses that are paid remain low when compared internationally. It should be noted that Japan scores even lower than countries such as Italy and Spain—laggards in work-family reconciliation policies.

It is well known that childcare centers for pre-school children alone do not reduce the childcare burden of mothers. There is an important issue of what to do with young school-age children before and after school hours and during school holidays. Sweden and Denmark are advanced in this area as well. According to data published by the OECD, more than 80% of children in lower grade levels participate in after-school care.[3] More than 40%

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[3] OECD Family Database (2011), Table PF4.3.A. Online data.

participate in the Netherlands, while upwards of 15% to 20% participate in Canada, the UK, Portugal, and Greece. On the other hand, rates of participation in such programs are lower in Germany, Italy, Spain, Japan, and South Korea. In the US, the situation varies widely by school district, and US data is not included in the OECD data. In districts with large numbers of two-income households, before- and after-school programs as well as summer programs are available for a fee.

Nordic countries may seem like something of a utopia for working women, but they, too, still face highly gender segregated labor markets and persistent gendered division of labor. This may be because generously paid childcare leaves lead to more mothers taking time off work, thus solidifying the gendered division of labor. Gendered division of labor means that women have fewer hours available for paid work as they do most of the unpaid work at home. As a result, men's commitment to work, in contrast, appears stronger relative to women's. This perceived or real difference in work commitment might explain why men dominate important management positions in private companies in Nordic countries. This mechanism might also explain the large size of the gender gap among high wage earners in Nordic countries as shown in Figure 2. It is worth noting that Denmark differs from other Nordic countries in Figure 2. Denmark does not demonstrate a large gender wage gap among high earners. Not incidentally, Denmark offers a relatively short fully-paid childcare leave, and children start going to public childncare centers early. As a result, Danish mothers' spend mush less time off work compared to mothers in other Nordic countries.

In light of the persisting gender inequality, the Swedish government has introduced something called "Daddy leave" in order to incentivize fathers to take time off work. Daddy leave is an extra childcare leave for which only fathers are eligible. Unlike regular paid childcare leave, which can be taken by either parent, Daddy leave is only offered to fathers, and cannot be transferred to mothers. It was initially introduced in Norway in 1993, followed by Sweden in 1995.[4] At the beginning, it was a special one-month leave, so the program was called "Daddy Month." In 2002, it was extended to two months. In addition, in 2008, a tax incentive was introduced to encourage both parents to take equal time off for childcare leave (Duvander and Andersson 2005; Sato and Takeishi 2004). In 1990, men accounted for 8.8% of the total childcare leave hours taken nationwide, but by 2007, this figure had risen to 21.8% (Haataja 2009). In Sweden, 80% of the fathers of newborns take childcare leave. Sweden is today a leader in terms of the childcare leave taken by fathers. [5] Nonetheless, most childcare leave is taken by mothers, and there has not been any change in

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[4] Facing a persistent under-representation of women in boardrooms, the Norwegian government adopted a quota system that requires 40% of all corporate boards to be comprised of women in 2006. As a result, while women accounted for 7% of corporate boards in Norway in 2003, by 2008 they accounted for 40%, surpassing even the US which had boasted the highest ratio of women on boards prior up to that time. Unlike in the case of Daddy leave, Sweden has not adopted the Norwegian quota strategy.

[5] In Norway, which has the next highest percentage of childcare leave hours taken by men behind Sweden, the percentage is 11.4%, while rates in Denmark and Finland are even lower (Haataja 2009).

the division of housework between men and women.[6]

IV. The Scenario in the US: Support for Women Using the "Stick" and the Role of the Market

In the US, obvious forms of employment discrimination against women—such as a "marriage bar"—persisted up until the 1950s (Goldin 1991). The 1964 Civil Rights Act and the 1963 Equal Pay Act, which were established in response to the civil rights movement of the 1960s, provided the legal foundation for the development of anti-discrimination laws at workplace later in the US. Employment discrimination against pregnant women was also prohibited as a violation of their civil rights. The enactment of these laws led to courtroom battles over anti-discrimination cases. The US has a civil procedure known as a class-action lawsuit, the damages from which, if awarded, can be quite costly for the losing defendant. For financial reasons, companies therefore have to be very careful about their legal compliance. This is not to say that companies that engage in subtle forms of discrimination have been completely eliminated. However, since larger companies would potentially be liable for larger financial damages in the event of a class-action suit, large companies have had to adopt personnel policies that enable them to prove that their hiring and promotion decisions are made based on objective criteria rather than discrimination.[7] As has been pointed out by Frank Dobbin (2009), the increasing number of women working in the human resource departments of large US companies have provided a major boost to efforts to reform corporate culture in the US. Aside from the role of the courts, the US government has also played an active role in changing the corporate and organizational culture by means of affirmative action. The US government has ensured that companies and organizations that receive government financial aid increased the number of minorities and women, who have traditionally been subject to discrimination, in various positions, through affirmative action measures (O'Conner, Orloff, and Shaver 1999).

However, strong commitment to anti-discrimination within the workplace still does not solve the issue of work-family reconciliation. In the US, where the government does not provide support for childrearing, how have women been able to move into the workforce while reconciling work and home? How have American women been able to move into management positions to an even greater degree than women in Nordic countries, which are more advanced in terms of the support for working mothers?

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[6] When husbands take childcare leave, it puts upward pressure on women's wages (Johansson 2010).

[7] For example, a recent class-action lawsuit was filed in 2007 by female financial advisors against the financial company Morgan Stanley (Augst-Johnson v. Morgan Stanley & Co). The court ordered Morgan Stanley to pay $46 million (¥2.88 billion at an exchange rate of ¥80 per $1) plus the lawyers' fees. This year, however, the US courts dismissed a class-action lawsuit regarding women's discrimination against Walmart, the nation's largest retailer. This may mean that the role of the judicial system is falling back in terms of its ability to help find solutions to the discrimination problem.

The Wage Gap and Labor Market Fluidity in the US

The specific characteristics of the labor market and education system in the US play a role in shaping the opportunity structure for women. First, the US has a high level of wage inequality. Wage inequality is typically associated with greater gender wage gap and poverty. However, there are important gendered effects that have not been emphasized sufficiently. When the wages of highly educated workers are relatively much higher than the wages of unskilled workers, it becomes easier for highly educated women to outsource housework and childcare services.

The ability to outsource housework is a major factor in a woman's ability to succeed in a management or professional position. In countries with high employment rates among married women, the number of hours spent on housework is relatively reduced, but wives still spend more time doing housework than their husbands. Even in Nordic countries, which encourage men to take childcare leave, most of the housework is done by women. The number of hours that married men spend on childrearing has increased in both the US and Europe, but the number of hours spent on housework has not. In other words, there is a persisting gap in the number of hours that can be allocated to paid work between highly educated/highly skilled married women and men. If married women have the option of outsourcing housework, this gap can be narrowed. In Nordic countries, which have an extremely small wage gap and high tax rates, it is difficult for the outsourcing of housework to occur, and this may lead to the persistence of gender gap in time allocation patterns. A comparison of 16 countries I conducted using the International Social Survey Program (ISSP) revealed a positive correlation between the size of the wage gap and the working hours of women. Because this survey contains micro data, it was possible to control for individual attributes, but the same correlation was not found for men (Estévez-Abe and Linos 2004; Estévez-Abe 2010, 2011).

As already seen, in spite of the fact that American women have moved into management and other higher level positions to a greater degree than women in other countries, a large gap remains between men and women in the upper wage bracket. Unlike in Nordic countries, the US government does not offer work-family reconciliation programs that reduce mothers' time off work. What then explains the gender wage gap among high earners? In order to answer this question, we have to take into consideration wage levels by sector. In the US, the non-profit sector constitutes a very important segment of the economy alongside the private for-profit sector and the government sector. In the health services, social services, and education sectors, which employ a lot of women, employment by non-profit organizations (NPOs) accounts for a very large share of employment (Warren 2008). Because non-profit organizations pay less for the same occupations, women's wages get affected. However, working conditions at NPOs are often more favorable to mothers than those at private companies, and thus serve to expand the options available to women.

Japan

Sweden

United States

Note: Horizontal axis indicates eight categories of working hours per week. The light grey column is the ratio of the women who work each number of work hours to the total number of women. The dark column is the same, for men.)

Source: OECD Family Database online (2011), LMF2.1.
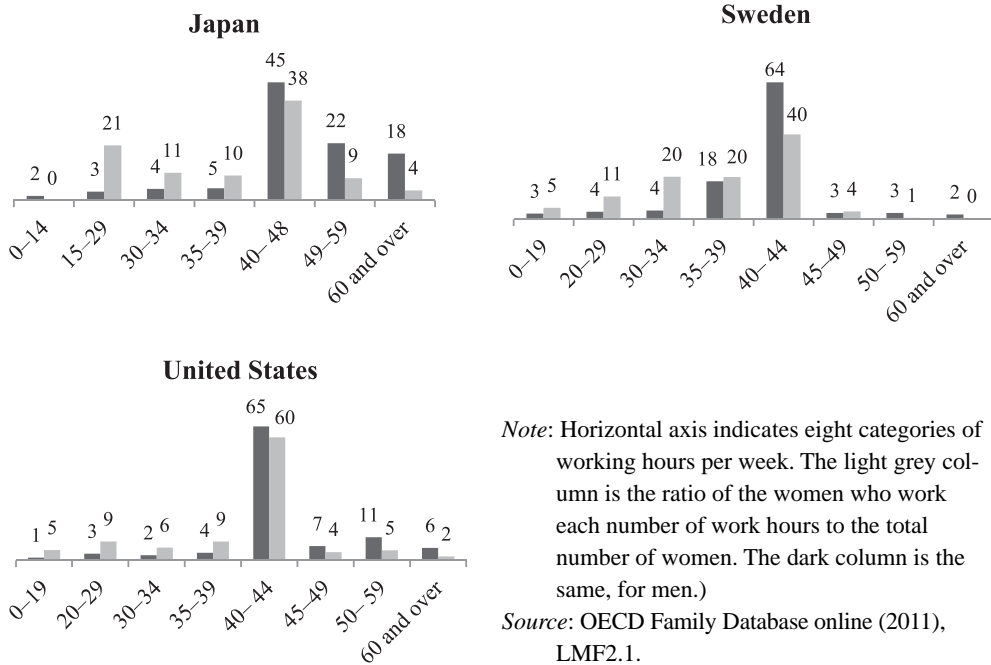
Figure 7. Usual Working Hours per Week by Gender in Japan, Sweden and the US (2007)

Figure 7 shows a comparison of the distribution of working hours by gender in Japan, Sweden, and the US. Although working hours in Sweden are shorter overall (for both men and women), a gap between men and women seems to be bigger there than in the US. Among the three countries, the US has the smallest gender gap. This is consistent with the fact that it is easy in the US for women to outsource housework. The narrowing of the gender gap in working hours due to the outsourcing of housework helps enable women to move into professional or management positions that require a commitment to long work hours.[8] It is interesting to note that over the past several years, governments in northern Europe have adopted policies to enable working women to reduce their housework burden, including such measures as offering a tax deduction for outsourcing household services.

Beyond the wage gap, the US has a much more flexible labor market when compared to Japan and most of European countries. Flexibility makes it possible for a variety of work patterns to emerge.[9] Professional women in the US who have valuable skills may be able to

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[8] In the US, both men and women work very long hours. Whether this is desirable as a work pattern is an important question. However, here we are only discussing this issue from the perspective of differences between men and women.

[9] Low-skilled workers have little bargaining power because of their strong substitutability, but their bargaining power becomes stronger as they become more highly skilled.

negotiate to work from home to work as freelancers while their children are young. Women who are not as highly skilled may temporarily leave the labor market while their children are young and then return after they have gotten a little older. In occupations that are highly unionized, such as public school teachers, where the effects of seniority on wages and benefits are significant, female workers might have a greater incentive to maintain employment continuity even during child-rearing years. However, in private occupations that are not unionized, the financial penalties for temporarily leaving work and returning later are not that large. The US labor market is very different from the Japanese or Continental Euopean labor markets, where "good jobs" are horded in internal labor markets. In Japan and continental European countries, those who quit to raise children can only be reemployed in the second tier of the job market. Furthermore, because the US social security system for old age pension is designed to be neutral with regard to work pattern, the penalty for interrupting work to raise young children (i.e. reduced pension benefits) is much smaller than in Japan and Continental European countries.[10]

Factors that help create gender neutral labor market hence include the neutral design of the social security system, relatively weak internal labor market (i.e. the existence of a sizable external labor market), clear job descriptions when recruiting hiring and promoting workers. The role of graduate schools is also important. In the US, young workers repeatedly change jobs, and take a long time until they settle down into a career. During this time, they not only move between companies, but they may go back to school, enrolling in a professional graduate school program, for example, or enrolling in a master's degree program in a particular field. They may do this to boost their career or to move into an entirely different field altogether. Once they establish a career within a company or within a particular profession, they can also apply for other jobs in external markets to move up the job ladder.

In the US, individual women can fine-tune their work and family lives in consideration of their own preferences and financial situations.[11] Women with a strong professional identity, who define themselves by their work as researchers or lawyers will continue to work during childrearing years by paying high childcare costs. Other women who define themselves more as mothers and less in terms of careers might choose to stay home while their children are young if their husband's income is enough to maintain the family. It cannot be denied that that the system is harsh for women with little education. As they receive low wages and are often single or married to low income men, they cannot take advantage of diverse options available to women with more education and income. However, it is a

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[10] Of course, the benefits will be lower for someone who leaves and returns, but the system is not designed in such a way that, as is the case in Japan and Germany, workers must pay their insurance premiums continuously for 40 years in order to receive the full benefit amount.

[11] Hakim (2002) argues that there are different types of women, such as career-minded women and strongly family-minded women, and that these differences account for labor participation rates and the desire to remain continuously employed. The criticism against this argument is that it underestimates the fact that the distribution of women's orientations itself is governed by the institutional structure.

system in which highly educated women can build a career over a lifetime unlike in Japan, where even highly educated women find it difficult to build careers.

V. The "Silent Revolution": The Formation of the Professional Identify of Highly Educated Women and the Education System

At the end of the last section I touched upon the concept of "identity." This section dicusses how and when women's identity changes. After a brief discussion of the US experience, I will contrast Japan and Spain as a way of highlighting the difficulties that face Japanese women.

Catherine Hakim (2002) and Claudia Goldin (2006) argue that a woman's self-identity significantly influences her lifelong work patterns. Goldin referred to the trend toward the higher education of women that occurred in the US in the 1970s as the "silent revolution" (Goldin 2006; Goldin and Katz 2000). The 1960s are known for the civil rights movement, changes in sexual mores, and the widespread adoption of oral contraceptives. The women of this generation, who gained a way to control their own fertility decisions, began to make different investments in education than previous generations. In this generation and beyond, the rates of female enrolment in professional schools such as medical schools and law schools, began to expand.[12] A new cohort of women thus emerged in the US, who had come to see their career as part of their identity by the time they decided to become mothers. Combined with the anti-discrimination law discussed earlier, the door was opened for these women to join the ranks of professionals and managers, positions that had typically only been occupied by men. To reiterate, these women, unlike the generation before, were the first generation of women to see work as a career, and a career as part of their self-identity.

I have noted earlier that, compared to Japanese women, Spanish women have achieved a much higher social status. This contrast is meaningful because both countries score low on work-family reconciliation policies and both suffer from highly gendered division of labor (both Japanese and Spanish men do very little housework). What factors then explain the Japan-Spain contrast? Just like professional schools in the US offered employment-relevant venues of educational investment, Spanish universities played a role. Spanish universities have traditionally been more specialized in much the same way as professional schools.[13] Selecting an undergraduate program is essentially the equivalent of selecting one's future profession. Because of the high level of specialization in undergraduate educa-

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[12] In the US, it was emphasized that undergraduate students should study a wide range of topics and acquire the basic intellectual foundations of knowledge, and that the training of doctors and lawyers would occur at the graduate school level.

[13] Spain is not an exception in this regard. Many university programs in Europe are more specialized because they do not offer liberal arts education as in US universities. For more on the relationship between the education system and gender, see my manuscript (Estévez-Abe 2006, 2012).

tion, young women who aspire to have a career would select a major that leads to a specific profession such as medicine or law. Under this system, from early on, women who invested in tertiary degrees saw themselves as a "specialist" in a particular field of work. Furthermore, women would choose fields of specialization that would allow them to continue working even after having children. Unlike postwar Japan, where the rate of advancement to high school was extremely high, Spain had a population with a relatively low overall education level, and this made it easy for university-educated women to use their earnings to hire less educated women to do the housework for them. When the supply of low skill native women eventually declined as the overall education level of younger cohorts of Spaniards rose, foreign migrant workers picked up the slack and began to work as maids and baby sitters.

Japanese universities, in contrast, do not play much of a role in shaping the professional identity or careers of young women. Japan adopted the US style liberal education model without supplementing it with the US style post-graduate professional schools.[14] As a result, outside of a few majors such as medicine and engineering, universities do not provide specialized knowledge and training. The curricula are designed for the purpose of general education. University graduates, therefore, might develop strong loyalty to their alma mater and form their identity as being alums of a particular university but are not likely to acquire any professional or occupational identity. In Japan, it is more common for professional or occupational identify formation to take place within companies. Most young Japanese receive job-relevant skills at work, and will formulate their professional and occupational identities as members of specific corporations.

An important difference between Japan and Spain is that, while young women in Spain can use the education system to actively decide what kind of careers they want to develop, most of young women in Japan end up relying on their employers to define their identities. In societies where gender discrimination exists, the intervention of an employer in one's career development is likely to deter women's advancement rather than help it. (Estévez-Abe, Iversen, and Soskice 2001; Estévez-Abe 2005, 2006).

There are two other important differences between Japan and Spain in factors that affect young women's decision to develop careers. The first difference is that Japan is behind Spain—or any other developed country—in terms of the widespread use of oral contraceptives and other contraceptive methods for women. Thus, a large number of unwanted pregnancies occur in Japan because women have to rely on their male partners' cooperation to prevent unwanted pregnancies (United Nations 2008; Norgren 2001). This is a significant barrier for something like what Goldin referred to as the "silent revolution" to occur. The second difference is that professional women in Spain find it much easier to outsource unpaid domestic tasks than Japanese professional women do. In addition to differences in the supply of low skill labor, the wage structure based on seniority narrows the wage gap be-

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[14] Japan introduced the US style law schools in 2004.

tween high skill women and low skill workers in Japan. For this reason, the outsourcing of housework and childcare is relatively expensive and difficult in Japan. Japan has not had a situation like that in Spain, where women who have acquired a professional position upon graduating from college have found it easy to purchase housework and childcare services from less educated women.

VI. The Future for Japanese Women

The preceding sections have shown that there are multiple paths to gender equality. Aside from work-family reconciliation policies, factors such as the enforcement of anti-discrimination law, the nature of education systems and the diffusion of contraceptive pills matter. Japan does not only lag in the development of work-family reconciliation policies but it also lacks all the other factors that promote gender equality. Japan's anti-discrimination law has not been very effective. Nothing like class-action lawsuits or affirmative action exists in Japan. The educational system does not serve as a venue for young women to overcome some of employer discrimination by building stronger resumes. Moreover, the labor market is such that outsourcing of unpaid domestic tasks is difficult. Contraceptive options are limited too. As a result, once married, young women lose control over their bodies and become burdened with domestic chores.

The contrast between Japan and Spain is particularly illuminating. Spain, like Japan, scores very low when it comes to work-family reconciliation policies. Spain, however, is endowed with other conditions that are favorable to educated women while Japan is not. As a result, educated Spanish women have been able to advance into high status occupations to a much greater degree than Japanese women.

The identities of Japanese women are just starting to change. In the US, a wave of female advancement into graduate schools began to occur in the 1970s, but in Japan, the change came much later. Traditionally, Japanese young women (and their families) used to prefer two-year junior colleges to four-year universities. Although the number of women enrolling in four-year universities began to increase in the mid-1980s, it was only in 1996 that the number of women enrolled in four-year universities surpassed that of two-year colleges. It should be noted that the enactment of the Equal Opportunity Act coincided with the rise of female enrollment in four-year universities in the mid-1980s. It was around this time that large Japanese enterprises began hiring female graduates of four-year universities into full-time career-track positions. Clearly, witnessing the changes in the labor market affected the educational investment decisions of the cohorts of women that followed. In 1997, a reversal occurred in the number of male breadwinner households, in which the husband works and the woman stays at home, and the number of dual-earner households (Cabinet Office 2010).

However, changes in Japan are very modest compared to the scope of transformation other advanced industrial societies have already gone through. In Japan, even today many

female college graduates exit the labor market when they have children (Hirao 2001, 2010; Higuchi and Iwata 1999; Wakisaka and Tomita 2001). With the social advancement of Japanese women about 30 to 40 years behind the US, what can be done to improve the situation? As already pointed out, Japanese companies play a particularly strong role in occupational training. This means that any discrimination that is present at the workplace today affects the human capital development of the next generation of women. In order to increase the number of women in the "pipeline" capable to assuming leadership positions in the private sector in the future, the government has to play a much more active role—by offering both carrots and sticks. The Japanese government has been lukewarm when it comes to promoting gender equality. Neither has it improved the work-family reconciliation package to the meaningful level nor has it strengthened its monitoring and punishment of discriminatory practices. Nothing like class-action lawsuits or affirmative action exists in Japan. Japan's anti-discrimination law has not been very effective because the government itself has never whole-heartedly endorsed gender equality or even tried to solve the problem of declining fertility.

Dramatic improvements in gender equality and family-work reconciliation are only possible when the government makes an unambiguous commitment. The Swedish and American experience has shown that the governmental policies can mold the society in a particular direction. This paper has shown that, while there are multiple paths to the integration of women into the labor force, the governmental commitment has been a key "transformative" factor. This means that the Japanese government either has to dramatically expand cash benefits for childcare leaves and public childcare services, subsidize private childcare and other domestic services, or implement more stringent equality policies including affirmative action and quotas.

Given Japan's financial situation, which has only worsened since the Great East Japan Earthquake, it might be difficult to expand public childcare center services or increase the level of wage replacement benefits during childcare leave. Japan should, however, seriously consider policies that incur little fiscal burden such as affirmative action and quotas. Reforming tax and social insurance systems in order to enhance labor market neutrality would be another area where changes can be introduced without any fiscal burden.

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Estimation of Input-Output Tables and Simulations of Employment Inducement Focusing on Small Regions: Case of Kumamoto Prefecture

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The ongoing trend toward decentralization will enhance the future role that local governments play throughout the labor policy process. It will be important that local governments have clear visions and comprehensive strategies for job creation and that they properly implement labor policies specifically suited to the circumstances of their respective regions. However, few small local governments have their own visions or plans for job creation. In light of this situation, this study aims to develop and propose an approach for estimating regional input-output tables focused on small regions by applying a gravity model, and to create specific plans for investment and production activities and simulate employment inducement based on the comprehensive national strategy through the use of such tables, as a tool for small local governments to use in drafting visions or comprehensive strategies for job creation that incorporate specific numerical targets.

I.   Introduction

The ongoing trend toward decentralization will enhance the future role that local governments play throughout the labor policy process, from planning to implementation. It will be important that local governments have clear visions and comprehensive strategies for job creation and that they properly implement labor policies specifically suited to the circumstances of their respective regions.

According to a 2004 survey conducted by the Japan Institute for Labour Policy and Training (JILPT), in contrast with prefectures and Cabinet order-designated cities, most smaller local governments, such as those of municipalities, had no visions or plans for job creation (Watanabe 2007). In the wake of the municipal merger movements that commenced in 1999, an increasing number of local governments have drafted visions or plans after such mergers, but the majority still have not (Watanabe 2009).

In view of this situation, this study aims to develop and propose an approach for estimating regional input-output tables focused on small regions and to simulate employment inducement through the use of such tables, as a tool for local governments to use in drafting visions or comprehensive strategies for job creation that incorporate specific numerical targets.

There are two possible approaches to setting target numbers for the creation of new jobs: a bottom-up approach and a top-down approach. In the bottom-up approach, the number of jobs that the various divisions within a local government intend to create by inviting

enterprises or carrying out investment plans are collected and totaled.[1] In the top-down approach, the number of new jobs to be created is based on information reported by the respective local government divisions, and also incorporates the interdependent relationships within overall regional economies, including trade with other regions. The approach adopted in this study, which is based on the input-output tables, is an example of the latter approach. This approach enables estimates which incorporate the repercussions between industries and the bounding-out effects between regions, or, in other words, estimates which reflect progress in the development of regional industrial clusters and inter-regional and inter-industry supply chains.

One obstacle to the use of this approach is the limited statistical data available concerning specific regions when compared to the nationwide data. For example, only a few surveys have captured inter-regional trade relationships in terms of monetary amounts. The Commodity Distribution Survey is one such survey, and is conducted by regional bureaus of economy, trade and industry to allow regional and prefectural versions of input-output tables to be compiled, but it is not useful for this study because it does not go into the details of trade between small regions—the main subject of this survey. An independent, detailed survey would be costly and difficult to perform accurately, however. To overcome this problem, material flow data can be used as a substitute. By making reference to the survey reports compiled by the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) (namely, the Report on Cargo Flow in Japan, the Report on Passenger Flow in Japan, and the Survey on Net Cargo Flow in Japan [Material Flow Census]), it is possible to capture inter-prefectural transport volume in terms of material flow, by type of transportation and goods. However, this approach also fails to reveal the trade relationships among units smaller than prefectures.[2]

Due to the difficulty of directly investigating inter-regional trade relationships, a non-survey approach that estimates inter-regional trade based on other sources of information is often adopted as an effective methodology. There are two representative estimation methods for a non-survey approach.[3] One is the use of location quotient (LQ) techniques. This method uses a specification coefficient for each region to determine whether demand exceeds supply in the region, or in other words, whether the local economy in the region is self-sufficient, based on the assumption that an inflow of goods from other regions indicates a lack of self-sufficiency while an outflow of goods to other regions exists if supply exceeds demand in the region. However, this method is of course unable to estimate

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[1] A problem that must be addressed in the first place is that small local governments mostly do not have divisions specialized in dealing with labor policy due to the limited financial and human resources.

[2] The Report on Cargo Flow in Japan and the Report on Passenger Flow in Japan provide data on subdivided regions only with regard to Hokkaido (seven blocks in the former and four blocks in the latter).

[3] For details of these non-survey approach methods, see Nakano and Nishimura (2012).

cross hauling—the simultaneous inflow and outflow of the same type of goods.

Another representative estimation method is a bi-proportional method, such as the RAS method, which takes into account the commodity balance, that is, the consistency with the sums of rows and the sums of columns in the input-output table matrices for a region. For example, it estimates the trade volume in the place of destination or place of origin so that it matches the total inflow or total outflow by sector that can be found in the input-output tables for the region. However, this method is also unable to account for cross hauling in its estimates of inter-regional trade unless cross hauling is included among the data available on inter-regional trade not included in the input-output tables.

As compared to these major estimation methods, a simpler method of estimating inter-regional trade while taking account of cross hauling is to employ a gravity model, such as the method advocated by Leontief and Strout (1963) (Begg 1985; Hitomi 2000; Kronenberg 2010).[4] There are many variations in this model according to the variables to be used; for example, whether the physical distance between regions or the freight charge amount are used as variables to take account of the possible obstacles they form to inter-regional trade. By employing such variables, this method makes it possible to estimate inter-regional trade without ignoring cross hauling.

This study also employs a gravity model for estimating inter-regional trade. In a great difference from preceding studies, this study applies the approach advocated by Nakano and Nishimura (2012), which divides existing regional input-output tables which include cross hauling—e.g. input-output tables compiled by prefectures and those complied by regional bureaus of economy, trade, and industry—into regions smaller than prefectures or regional blocks, without changing the inter-prefectural or inter-regional trade structure.

Thus, this study estimates multi-regional input-output tables for small regions while remaining consistent with existing input-output tables and without eliminating cross hauling, and then measures the amount of employment induced when given a forecast or numerical target for final demand. Specifically, this study uses the urban area of Kumamoto Prefecture as its target region.

This paper is organized in the following way. Section II presents an analytical model for measuring the amount of induced employment based on multi-regional input-output tables. Section III explains the method employed to estimate the multi-regional input-output tables using the Kumamoto urban area as an example, and examines supplementary employment coefficients. Section IV simulates to measure the amount of induced employment

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[4] Kaneko (1967) and Ihara (1996) estimated parameters by applying a gravity model to the Inter-Regional Input-Output Tables compiled by the Ministry of International Trade and Industry. Ihara discussed the benefits and limits of the use of a gravity model when estimating inter-regional flows of goods. Hitomi (2000) attempted to rearrange the Inter-Regional Input-Output Tables into ten power distribution areas (which is different from this study's focus on smaller areas), and estimated the amount of trade between two regions based on a gravity model using data on inter-regional trade in the service sector.

by assigning the estimated input-output tables as well as variables including a forecast and numerical target for final demand to the analytical model. Section V presents conclusions drawn from the analysis.

II. Multi-Regional Input-Output Model

In the competitive inflow/import type input-output tables among the three regions to be estimated in this study, the equilibrium solution of regional production is obtained according to the following steps.

(i) The coefficient of inflow into region k from region l (the ratio of inflow to total demand in region k) is defined as described in formula (1).

$$r_i^{lk} = \frac{t_i^{lk}}{\sum_j x_{ij}^k + f_i^k} \qquad (1)$$

Wherein r_i^{lk} is the coefficient of inflow into region k from region 1 in sector i; t_i^{lk} is inflow from region l into region k in sector i (outflow from region l to region k); x_{ij}^k is the intermediate demand in sector i relating to sector j of region k; and f_i^k is the regional final demand in sector i of region k.

(ii) With the coefficient of inflow defined in (1), the equation for multi-regional input-output tables can be expressed by formula (2).

$$\mathbf{x} = \left(\mathbf{I} - \hat{\mathbf{M}} - \mathbf{T}\right)\left(\mathbf{A}\mathbf{x} + \mathbf{f}\right) + \mathbf{e} \qquad (2)$$

Wherein $\mathbf{x}$ is the regional production vector; $\mathbf{I}$ is the identity matrix; $\mathbf{A}$ is the input coefficient matrix; $\hat{\mathbf{M}}$ is the import coefficient matrix; $\mathbf{T}$ is the inflow coefficient matrix; $\mathbf{f}$ is the regional final demand vector; and $\mathbf{e}$ is the export vector.

The vectors and matrices contained in the above formula consist of the regional vectors and matrices shown below.

$$\mathbf{x} = \begin{pmatrix} \mathbf{x}^1 \\ \mathbf{x}^2 \\ \mathbf{x}^3 \end{pmatrix}, \quad \mathbf{A} = \begin{pmatrix} \mathbf{A}^1 & \mathbf{0} & \mathbf{0} \\ \mathbf{0} & \mathbf{A}^2 & \mathbf{0} \\ \mathbf{0} & \mathbf{0} & \mathbf{A}^3 \end{pmatrix}, \quad \hat{\mathbf{M}} = \begin{pmatrix} \hat{\mathbf{M}}^1 & \mathbf{0} & \mathbf{0} \\ \mathbf{0} & \hat{\mathbf{M}}^2 & \mathbf{0} \\ \mathbf{0} & \mathbf{0} & \hat{\mathbf{M}}^3 \end{pmatrix},$$

$$\mathbf{T} = \begin{pmatrix} \hat{\mathbf{R}}^{21} + \hat{\mathbf{R}}^{31} & -\hat{\mathbf{R}}^{12} & -\hat{\mathbf{R}}^{13} \\ -\hat{\mathbf{R}}^{21} & \hat{\mathbf{R}}^{12} + \hat{\mathbf{R}}^{32} & -\hat{\mathbf{R}}^{23} \\ -\hat{\mathbf{R}}^{31} & -\hat{\mathbf{R}}^{32} & \hat{\mathbf{R}}^{13} + \hat{\mathbf{R}}^{23} \end{pmatrix}, \quad \mathbf{f} = \begin{pmatrix} \mathbf{f}^1 \\ \mathbf{f}^2 \\ \mathbf{f}^3 \end{pmatrix}, \quad \mathbf{e} = \begin{pmatrix} \mathbf{e}^1 \\ \mathbf{e}^2 \\ \mathbf{e}^3 \end{pmatrix}$$

Wherein $\mathbf{x}^k$ is the regional production vector in region k; $\mathbf{A}^k$ is the input coefficient matrix in region k; $\hat{\mathbf{M}}^k$ is the import coefficient matrix in region k; $\hat{\mathbf{R}}^{lk}$ is the in-

flow coefficient matrix for the inflow into region k from region l; $\mathbf{f^k}$ is the regional final demand vector in region k; and $\mathbf{e^k}$ is the export vector in region k.

The regional vectors and matrices consist of the following elements.

$$\mathbf{x^k} = \begin{pmatrix} x_1^k \\ \vdots \\ x_{44}^k \end{pmatrix}, \quad \mathbf{A^k} = \begin{pmatrix} a_{1,1}^k & \cdots & a_{1,44}^k \\ \vdots & \ddots & \vdots \\ a_{44,1}^k & \cdots & a_{44,44}^k \end{pmatrix}, \quad \mathbf{\hat{M}^k} = \begin{pmatrix} r_1^{m,k} & 0 & 0 \\ 0 & \ddots & 0 \\ 0 & 0 & r_{44}^{m,k} \end{pmatrix}.$$

$$\mathbf{\hat{R}^{lk}} = \begin{pmatrix} r_1^{lk} & 0 & 0 \\ 0 & \ddots & 0 \\ 0 & 0 & r_{44}^{lk} \end{pmatrix}, \quad \mathbf{f^k} = \begin{pmatrix} f_1^k \\ \vdots \\ f_{44}^k \end{pmatrix}, \quad \mathbf{e^k} = \begin{pmatrix} e_1^k \\ \vdots \\ e_{44}^k \end{pmatrix}$$

Wherein x_i^k is the regional production in sector i of region k; a_{ij}^k is the input coefficient in sector j from sector i in region k; $r_i^{m,k}$ is the import coefficient in sector i of region k; and e_i^k is the export in sector i of region k.

(iii) By solving formula (2) in terms of x, formula (3) can be obtained. By assigning regional final demand and export to formula (3) and multiplying the Leontief inverse matrix, induced regional production can be calculated.

$$\mathbf{x} = \left\{ \mathbf{I} - \left(\mathbf{I} - \mathbf{\hat{M}} - \mathbf{T} \right) \mathbf{A} \right\}^{-1} \left\{ \left(\mathbf{I} - \mathbf{\hat{M}} - \mathbf{T} \right) \mathbf{f} + \mathbf{e} \right\} \qquad (3)$$

If the values calculated by dividing the number of employees and the number of employed persons at work by total production are referred to as employment coefficients, the employment coefficients by sector can be expressed by formulas (4) and (5).[5]

$$ue_j^k = \frac{em_j^k}{x_j^k} \qquad (4)$$

$$us_j^k = \frac{sh_j^k}{x_j^k} \qquad (5)$$

Wherein ue_j^k is the employment coefficient in sector j of region k (employee basis); em_j^k is the amount of induced employment in sector j of region k (employee basis); us_j^k is the employment coefficient in sector j of region k (employed-person-at-work basis); sh_j^k is the amount of induced employment in sector j of region k (employed-person-at-work basis).

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[5] "Employees" consists of "paid executives," "regular employees," and "temporary/daily employees." "Employed persons at work" includes "self-employed workers" and "family workers" in addition to "employees." There are also "employed persons not at work," who have jobs and are paid a wage or salary while absent from work due to sickness or paid leave.

Using formula (3) and the employment coefficients (formulas [4] and [5]), the amount of induced employment by sector can be expressed by formulas (6) and (7).

$$\mathbf{em} = \hat{\mathbf{U}}^{\mathbf{e}} \left\{ \mathbf{I} - \left(\mathbf{I} - \hat{\mathbf{M}} - \mathbf{T} \right) \mathbf{A} \right\}^{-1} \left\{ \left(\mathbf{I} - \hat{\mathbf{M}} - \mathbf{T} \right) \mathbf{f} + \mathbf{e} \right\} \qquad (6)$$

$$\mathbf{sh} = \hat{\mathbf{U}}^{\mathbf{s}} \left\{ \mathbf{I} - \left(\mathbf{I} - \hat{\mathbf{M}} - \mathbf{T} \right) \mathbf{A} \right\}^{-1} \left\{ \left(\mathbf{I} - \hat{\mathbf{M}} - \mathbf{T} \right) \mathbf{f} + \mathbf{e} \right\} \qquad (7)$$

Wherein **em** is the induced employment vector (employee basis); $\hat{\mathbf{U}}^{\mathbf{e}}$ is the employment coefficient matrix (employee basis); **sh** is the induced employment vector (employed-person-at-work basis); and $\hat{\mathbf{U}}^{\mathbf{s}}$ is the employment coefficient matrix (employed-person-at-work basis).

The regional composition of the vectors and matrices expressed by formulas (6) and (7) are as shown below.

$$\mathbf{em} = \begin{pmatrix} \mathbf{em}^1 \\ \mathbf{em}^2 \\ \mathbf{em}^3 \end{pmatrix}, \quad \hat{\mathbf{U}}^{\mathbf{e}} = \begin{pmatrix} \hat{\mathbf{U}}^{\mathbf{e},1} & \mathbf{0} & \mathbf{0} \\ \mathbf{0} & \hat{\mathbf{U}}^{\mathbf{e},2} & \mathbf{0} \\ \mathbf{0} & \mathbf{0} & \hat{\mathbf{U}}^{\mathbf{e},3} \end{pmatrix}, \quad \mathbf{sh} = \begin{pmatrix} \mathbf{sh}^1 \\ \mathbf{sh}^2 \\ \mathbf{sh}^3 \end{pmatrix}, \quad \hat{\mathbf{U}}^{\mathbf{s}} = \begin{pmatrix} \hat{\mathbf{U}}^{\mathbf{s},1} & \mathbf{0} & \mathbf{0} \\ \mathbf{0} & \hat{\mathbf{U}}^{\mathbf{s},2} & \mathbf{0} \\ \mathbf{0} & \mathbf{0} & \hat{\mathbf{U}}^{\mathbf{s},3} \end{pmatrix}$$

Wherein **em**$^{\mathbf{k}}$ is the induced employment vector in region k (employee basis); $\hat{\mathbf{U}}^{\mathbf{e},\mathbf{k}}$ is the employment coefficient matrix in region k (employee basis); **sh**$^{\mathbf{k}}$ is the induced employment vector in region k (employed-person-at-work basis); and $\hat{\mathbf{U}}^{\mathbf{s},\mathbf{k}}$ is the employment coefficient matrix in region k (employed-person-at-work basis).

The sectoral compositions of the above described vectors and matrices are as shown below.

$$\mathbf{em}^{\mathbf{k}} = \begin{pmatrix} em_1^k \\ \vdots \\ em_n^k \end{pmatrix}, \quad \hat{\mathbf{U}}^{\mathbf{e},\mathbf{k}} = \begin{pmatrix} ue_1^k & 0 & 0 \\ 0 & \ddots & 0 \\ 0 & 0 & ue_n^k \end{pmatrix}, \quad \mathbf{sh}^{\mathbf{k}} = \begin{pmatrix} sh_1^k \\ \vdots \\ sh_n^k \end{pmatrix}, \quad \hat{\mathbf{U}}^{\mathbf{s},\mathbf{k}} = \begin{pmatrix} us_1^k & 0 & 0 \\ 0 & \ddots & 0 \\ 0 & 0 & us_n^k \end{pmatrix}$$

Wherein em_i^k is the induced employment in sector i of region k (employee basis); ue_i^k is the employment coefficient in sector i of region k (employee basis); sh_i^k is the induced employment in sector i of region k (employed-person-at-work basis); and us_i^k is the employment coefficient in sector i of region k (employed-person-at-work basis).

By assigning final demand to formulas (3), (6) and (7), induced regional production and employment can be measured while taking inter-regional repercussions into account.

III. Estimation of Inter-Regional Input-Output Tables Focusing on the Kumamoto Urban Area

This study targets the Kumamoto urban area, which is composed of Kumamoto City and its surrounding municipalities (cities [*shi*], towns [*machi/cho*], and villages [*mura*]), and attempts to compile input-output tables for this area. There are two major reasons Kumamoto Prefecture in the Kyushu Region has been selected: the first is its proactive attitude toward inviting enterprises, and the second is its unique labor policies. In relation to the invitation of enterprises, the government of Kumamoto Prefecture provides more generous support to the enterprises it invites than the governments of other prefectures. In the interview survey, enterprises that moved to Kumamoto responded that while subsidies for the building of business establishments and tax benefits were available in other prefectures as well, Kumamoto's prompt and careful responses to their requests were superior to other prefectures. With regard to Kumamoto's unique labor policies, the "Kumamoto Prefecture Industry and Employment Creation Program (FY2008–FY2010)" is a recent example. This program was similar to the Regional Employment Creation Promotion Program (Package Program) spearheaded by the Ministry of Health, Labour and Welfare (MHLW), but was more convenient for local municipalities because the requirements for participation in the Kumamoto program were less strict than those of the MHLW program. Municipalities that participated in the Kumamoto program set up specialized units in charge of inviting enterprises, which led to further enhancement of the enterprise invitation system of Kumamoto Prefecture as a whole.

The Kumamoto urban area is composed of Kumamoto City and its neighboring municipalities, from which approximately 15% of residents commute to Kumamoto City to work or attend school (as of the 2005 Population Census). The constituent municipalities aim to cooperate to promote the growth of Kumamoto Prefecture as the center of the Kyushu Region, while reinforcing their own competitiveness within the area. This study divides Japan into three regions: the Kumamoto urban area, the other areas of Kumamoto, and areas of Japan other than Kumamoto Prefecture, and estimates multi-regional input-output tables to represent trade between these three regions. Figure 1 shows a model for representation. First, the tables for the Chenery-Moses model, or competitive inflow type, are estimated, and these are then converted into the Isard model, or non-competitive inflow type as shown in Figure 1, using the inflow coefficient. Since there are only two sets of input-output tables available for this study—the 2005 Input-Output Tables for Japan compiled by the Ministry of Internal Affairs and Communications (MIC) and the 2005 Input-Output Tables for Kumamoto Prefecture—, it is necessary to divide the Input-Output Tables for Kumamoto Prefecture into those related to the Kumamoto urban area and those related to the other areas of Kumamoto, and to estimate trade between the three regions mentioned above.

			Intermediate demand			Final demand					Regional production
			Kumamoto Prefecture		Other areas of Japan	Kumamoto Prefecture		Other areas of Japan	Export	Import	
			Urban area	Other areas		Urban area	Other areas				
Intermediate input	Kumamoto Prefecture	Urban area									
		Other areas									
	Other areas of Japan										
Value added											
Regional production											

Figure 1. Model for Multi-Regional Input-Output Tables for the Kumamoto Urban Area

Table 1. Municipalities Constituting the Kumamoto Urban Area and the Other Areas of Kumamoto

	Northern district	Central district	Southern district	Amakusa district
Kumamoto urban area	Koshi-shi Gyokuto-machi Ozu-machi Kikuyou-machi Kumamoto-shi	Uto-shi Uki-shi Mifune-machi Kashima-machi Mashiki-machi Kosa-machi Yamato-cho Misato-machi Nishihara-mura		
Other areas of Kumamoto	Arao-shi Tamana-shi Yamaga-shi Kikuchi-shi Nagomi-machi Nankan-machi Nagasu-machi Aso-shi Minamioguni-machi Oguni-machi Ubuyama-mura Takamori-machi Minamiaso-machi		Yatsushiro-shi Hitoyoshi-shi Minamata-shi Hikawa-cho Ashikita-machi Tsunagi-machi Nishiki-machi Asagiri-cho Taragi-machi Yunomae-machi Mizukami-mura Sagara-mura Itsuki-mura Yamae-mura Kuma-mura	Amakusa-shi Kamiamakusa-shi Reihoku-machi

Note: Since the former Ueki-machi, which is now part of Kumamoto City, is under the jurisdiction of the Kikuchi City public employment security office, the area of Kumamoto City extends over the northern and central districts.

1. Division of Input-Output Tables

Kumamoto Prefecture is divided into the Kumamoto urban area and the other areas of Kumamoto. Table 1 shows the municipalities that constitute the respective regions.[6] Kumamoto Prefecture is generally divided into four districts: the northern, central, southern, and Amakusa districts. The Kumamoto urban area covers the central district and part of the northern district.[7]

The Input-Output Tables for Kumamoto Prefecture have been divided via the following steps.

(i)   Among the final demand sectors, private consumption expenditures, general government consumption expenditures, and prefectural production have been divided between the Kumamoto urban area and the other areas of Kumamoto based on other statistical data (for the indicators for proportional distribution, see Table 2[8]).

(ii) Among the final demand sectors, gross regional fixed capital formation (public/private) has been estimated as follows. (1) The capital coefficient[9] based on capital flow has been estimated by dividing gross capital formation according to investor sector or type of investment goods (which is provided in the fixed capital matrix supplemented to the nationwide input-output tables) by domestic production according to investor sector. (2) Prefectural production according to investor sector for Kumamoto Prefecture and for the Kumamoto urban area has been multiplied by the respective capital coefficient, and then gross fixed formation according to type of investment goods is obtained by aggregating the result of (1) for all investor sectors. (3) The ratio between the estimated gross fixed capital formation according to type of investment goods for Kumamoto Prefecture and the gross fixed capital formation according to type of investment goods provided in the publicly available Input-Output Tables for Kumamoto Prefecture has been calculated. (4) The final gross fixed capital formation is obtained by multiplying the estimated gross fixed capital formation according to type of investment goods for the Kumamoto urban area by such adjustment ratio calculated in (3).

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[6] The geographical range of the Kumamoto urban area that is the focus of this study corresponds to the range of the municipalities that form the Kumamoto Urban Area Council established on April 1, 2010.

[7] It should be noted that the municipalities that constitute the four districts differ depending on the statistical survey or analyst. This study adopts the classifications of the Kumamoto Labour Bureau based on the zoning of the jurisdictional districts of public employment security offices.

[8] It should be noted that this statistical data is not completely consistent with the concept of *activity* applicable to input-output tables. This study basically uses production data, but sometimes uses data on the number of employed persons at work if production data is unavailable.

[9] The term "capital coefficient" is usually used when the numerator is capital stock.

(iii) Intermediate input (demand) is estimated by multiplying the regional production calculated in (i) by the input coefficient based on the Input-Output Tables for Kumamoto Prefecture. Similarly, gross value added is estimated by multiplying the regional production by the ratio of gross value added according to the respective item (the ratio of gross value added to the prefectural production as provided in the Input-Output Tables for Kumamoto Prefecture).

(iv) Among the final demand sectors, consumption expenditure outside households (column) is calculated by aggregating the consumption expenditure outside households (one of the items included in the gross value added as estimated in [iii]) and dividing it into sectors according to the distribution ratio of consumption expenditure outside households (column) in the Input-Output Tables for Kumamoto Prefecture.

(v) Among the final demand sectors, increase in stocks is divided into regions according to the method employed by Nishimura (2006). (1) The stock ratio s_i (the ratio of the increase in stocks to prefectural final demand) is calculated based on the Input-Output Tables for Kumamoto Prefecture (formula [9]).[10] (2) Private consumption expenditures and general government consumption expenditures as regionally divided in (i) and the gross regional fixed capital formation (public/private) and consumption expenditure outside households (column) as estimated in (ii) and (iv), respectively, are summed up and then divided by $1-s_i$ to obtain the regional final demand for each region (formula [10]). (3) The increase in stocks for each region can be calculated by deducting the sum of the private consumption expenditures, general government consumption expenditures, gross regional fixed capital formation (public/private), and consumption expenditure outside households (column) from the regional final demand.

$$f_i = f_i^{hg} + f_i^{hm} + f_i^{go} + f_i^{fk} + f_i^{fm} + f_i^{st} \qquad (8)$$

$$s_i = \frac{f_i^{st}}{f_i} \qquad (9)$$

$$f_i^k = \frac{f_i^{hg,k} + f_i^{hm,k} + f_i^{go,k} + f_i^{fk,k} + f_i^{fm,k}}{1-s_i} \qquad (10)$$

Wherein f_i is the regional final demand in sector i; f_i^{hg} is the consumption expendi-

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[10] With regard to sectors where the prefectural final demand is zero in the Input-Output Tables for Kumamoto Prefecture, the stock ratio s_i is defined as the ratio of the increase in stock to total prefectural demand. The total regional demand is calculated by dividing the total intermediate demand for each region by $1-s_i$. And then, the increase in stocks for each region is calculated by deducting the total intermediate demand from the total regional demand for each region.

ture outside households (column) in sector i; f_i^{hm} is the private consumption expenditure in sector i; f_i^{go} is the general government consumption expenditure in sector i; f_i^{fk} is the gross fixed capital formation (public) in sector i; f_i^{fm} is the gross fixed capital formation (private) in sector i; f_i^{st} is the increase in stocks in sector i; and s_i is the stock ratio in sector i. Elements with a letter k in superscript in formula (10) relate to region k, which is part of Kumamoto Prefecture, and those without this letter in formulas (8) to (10) relate to Kumamoto Prefecture.

(vi)   Among the final demand sectors, exports are assumed to be proportional to prefectural production whereas imports are assumed to be proportional to total prefectural demand, and the proportional ratios are calculated based on the Input-Output Tables for Kumamoto Prefecture (formulas [11] and [12]). By multiplying the regional production as calculated in (i) and the total regional demand as calculated from the data obtained in (ii) to (v) by these ratios, import and export for each region can be calculated.

$$r_i^e = \frac{e_i}{x_i} \qquad (11)$$

$$r_i^m = \frac{m_i}{\sum_j x_{ij} + f_i} \qquad (12)$$

Wherein r_i^e is the export ratio in sector i; e_i is the export amount in sector i; x_i is the prefectural production in sector i; r_i^m is the import ratio (import coefficient) in sector i; m_i is the import amount in sector i; and x_{ij} is the intermediate demand of sector i in sector j.

Regional production and final demand for areas of Japan other than Kumamoto Prefecture are calculated by deducting the data from the Input-Output Tables for Kumamoto Prefecture from the corresponding data from the Input-Output Tables for Japan.[11] For other areas of Japan, the input coefficient applicable to the nationwide input-output tables is used.

2. Estimation of Inter-Regional Trade

Given the regional production for each region and the final demand, excluding inter-regional trade (inflow/outflow) as calculated in the previous subsection, net inflow can be obtained using formula (13).

$$s_i = n_i - h_i = \left(\sum_j x_{ij} + f_i + e_i - m_i \right) - x_i \qquad (13)$$

Wherein s_i is the net inflow into sector i; n_i is the inflow into sector i; and h_i is the outflow from sector i.

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[11] It should be noted that there are some differences between the nationwide and prefectural input-output tables in terms of the definition of sectors and estimation methods.

Table 2. Indicators for Proportional Distribution Employed to Divide the Input-Output Tables for Kumamoto Prefecture

	Sector	Indicator for proportional distribution	Data source
1	Crop cultivation	Amount of agricultural output	Statistics of Agricultural Income Produced
2	Livestock	Amount of agricultural output	Statistics of Agricultural Income Produced
3	Agricultural services	Average of 1 and 2	
4	Forestry	Forest area	Census of Agriculture and Forestry
5	Fisheries	Fish catches in marine fisheries	Statistics on Marine Fishery Production
6	Metallic ores	Number of persons engaged	Establishment and Enterprise Census
7	Non-metallic ores	Number of persons engaged	Establishment and Enterprise Census
8	Coal mining , crude petroleum and natural gas	No production in Kumamoto Prefecture	
9	Foods	Value of shipments	Census of Manufacturers
10	Beverage	Value of shipments	Census of Manufacturers; 10-12 aggregated as "beverage"
11	Feeds and organic fertilizer, n.e.c.	Value of shipments	Census of Manufacturers; 10-12 aggregated as "beverage"
12	Tobacco	Value of shipments	Census of Manufacturers; 10-12 aggregated as "beverage"
13	Textile products	Value of shipments	Census of Manufacturers
14	Wearing apparel and other textile products	Value of shipments	Census of Manufacturers
15	Timber and wooden products	Value of shipments	Census of Manufacturers
16	Furniture and fixtures	Value of shipments	Census of Manufacturers
17	Pulp, paper, paperboard, building paper	Value of shipments	Census of Manufacturers; 17-18 aggregated as "pulp/paper"
18	Paper products	Value of shipments	Census of Manufacturers; 17-18 aggregated as "pulp/paper"
19	Printing, plate making and book binding	Value of shipments	Census of Manufacturers
20	Chemical fertilizer	Value of shipments	Census of Manufacturers; 20-27 aggregated as "chemicals"
21	Industrial inorganic chemicals	Value of shipments	Census of Manufacturers; 20-27 aggregated as "chemicals"
22	Petrochemical basic products	No production in Kumamoto Prefecture	
23	Organic chemical products (except Petrochemical basic products)	Value of shipments	Census of Manufacturers; 20-27 aggregated as "chemicals"
24	Synthetic resins	Value of shipments	Census of Manufacturers; 20-27 aggregated as "chemicals"
25	Synthetic fibers	No production in Kumamoto Prefecture	
26	Medicaments	Value of shipments	Census of Manufacturers; 20-27 aggregated as "chemicals"
27	Final chemical products, n.e.c.	Value of shipments	Census of Manufacturers; 20-27 aggregated as "chemicals"
28	Petroleum refinery products	Value of shipments	Census of Manufacturers; 28-29 aggregated as "petroleum/coal"
29	Coal products	Value of shipments	Census of Manufacturers; 28-29 aggregated as "petroleum/coal"
30	Plastic products	Value of shipments	Census of Manufacturers
31	Rubber products	Value of shipments	Census of Manufacturers
32	Leather, fur skins and miscellaneous leather products	Number of persons engaged	Establishment and Enterprise Census
33	Glass and glass products	Value of shipments	Census of Manufacturers; 33-36 aggregated as "ceramic/stone and clay"
34	Cement and cement products	Value of shipments	Census of Manufacturers; 33-36 aggregated as "ceramic/stone and clay"
35	Pottery, china and earthenware	Value of shipments	Census of Manufacturers; 33-36 aggregated as "ceramic/stone and clay"
36	Other ceramic, stone and clay products	Value of shipments	Census of Manufacturers; 33-36 aggregated as "ceramic/stone and clay"
37	Pig iron and crude steel	No production in Kumamoto Prefecture	
38	Steel products	Value of shipments	Census of Manufacturers; 38-40 aggregated as "iron and steel"
39	Cast and forged steel products	Value of shipments	Census of Manufacturers; 38-40 aggregated as "iron and steel"

Table 2 (*Continued*)

	Sector	Indicator for proportional distribution	Data source
40	Other iron or steel products	Value of shipments	Census of Manufacturers; 38-40 aggregated as "iron and steel"
41	Non-ferrous metals	Number of persons engaged	Establishment and Enterprise Census
42	Non-ferrous metal products	Number of persons engaged	Establishment and Enterprise Census
43	Metal products for construction and architecture	Value of shipments	Census of Manufacturers; 43-44 aggregated as "metal"
44	Other metal products	Value of shipments	Census of Manufacturers; 43-44 aggregated as "metal"
45	General industrial machinery	Value of shipments	Census of Manufacturers; 45-48 aggregated as "general machines"
46	Special industrial machinery	Value of shipments	Census of Manufacturers; 45-48 aggregated as "general machines"
47	Other general machines	Value of shipments	Census of Manufacturers; 45-48 aggregated as "general machines"
48	Machinery for office and service industry	Value of shipments	Census of Manufacturers; 45-48 aggregated as "general machines"
49	Electrical devices and parts	Value of shipments	Census of Manufacturers; 49-52 aggregated as "electrical equipment"
50	Applied electronic equipment and electric measuring instruments	Value of shipments	Census of Manufacturers; 49-52 aggregated as "electrical equipment"
51	Other electrical equipment	Value of shipments	Census of Manufacturers; 49-52 aggregated as "electrical equipment"
52	Household electric appliances	Value of shipments	Census of Manufacturers; 49-52 aggregated as "electrical equipment"
53	Household electronics equipment	Value of shipments	Census of Manufacturers; 53-54 aggregated as "information and communication equipment"
54	Electronic computing equipment and accessory equipment of electronic computing equipment	Value of shipments	Census of Manufacturers; 53-54 aggregated as "information and communication equipment"
55	Semiconductor devices and Integrated circuits	Value of shipments	Census of Manufacturers; 55-56 aggregated as "electronic components"
56	Other electronic components	Value of shipments	Census of Manufacturers; 55-56 aggregated as "electronic components"
57	Passenger motor cars	No production in Kumamoto Prefecture	
58	Other cars	Value of shipments	Census of Manufacturers; 58-61 aggregated as "transportation equipment"
59	Motor vehicle parts and accessories	Value of shipments	Census of Manufacturers; 58-61 aggregated as "transportation equipment"
60	Ships and repair of ships	Value of shipments	Census of Manufacturers; 58-61 aggregated as "transportation equipment"
61	Other transportation equipment and repair of transportation equipment	Value of shipments	Census of Manufacturers; 58-61 aggregated as "transportation equipment"
62	Precision instruments	Value of shipments	Census of Manufacturers
63	Miscellaneous manufacturing products	Value of shipments	Census of Manufacturers
64	Reuse and recycling	Annual sales of goods	Census of Commerce, wholesale trade, recovered material
65	Building construction	Contracted construction price (total)	Statistical Yearbook on Buildings
66	Repair of construction	Amount of municipal tax in account settlement (fixed asset tax)	Account Settlement Card
67	Public construction	Amount of expenditure in municipal general account settlement (civil engineering expenditure/agriculture, forestry and fisheries expenditure)	Account Settlement Card
68	Other civil engineering and construction	Average of 69 and 78	
69	Electricity	Power output and generation capacity at major power stations in Kumamoto Prefecture	Electric Power Survey Statistics, Kumamoto Prefecture Enterprise Bureau website, etc.
70	Gas and heat supply	Number of persons engaged	Establishment and Enterprise Census
71	Water supply	Quantity of water supply	Kumamoto Prefecture Statistical Yearbook

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Table 2 (*Continued*)

	Sector	Indicator for proportional distribution	Data source
72	Waste management service	Number of persons engaged	Establishment and Enterprise Census
73	Commerce	Annual sales of goods	Census of Commerce
74	Finance and insurance	Number of persons engaged	Establishment and Enterprise Census
75	Real estate agencies and rental services	Number of persons engaged	Establishment and Enterprise Census
76	House rent	Total floor space per household	Population Census
77	House rent (imputed house rent)	Total floor space per household (owner-occupied dwellings)	Population Census
78	Railway transport	Number of persons engaged	Establishment and Enterprise Census
79	Road transport (except transport by private cars)	Number of cars owned	Kumamoto Prefecture Statistical Yearbook
80	Self-transport by private cars	Number of cars owned (same as 79)	Kumamoto Prefecture Statistical Yearbook
81	Water transport	Inflow (import)/outflow (export)	Kumamoto Prefecture Statistical Yearbook
82	Air transport	Number of persons engaged	Establishment and Enterprise Census
83	Freight forwarding	Number of persons engaged	Establishment and Enterprise Census
84	Storage facility service	Number of persons engaged	Establishment and Enterprise Census
85	Services relating to transport	Number of persons engaged	Establishment and Enterprise Census
86	Communication	Number of persons engaged	Establishment and Enterprise Census
87	Broadcasting	Number of persons engaged	Establishment and Enterprise Census
88	Information services	Number of persons engaged	Establishment and Enterprise Census
89	Internet based services	Number of persons engaged	Establishment and Enterprise Census
90	Image information, character information production and distribution	Number of persons engaged	Establishment and Enterprise Census
91	Public administration	Number of municipal officials (No. of prefectural officials assigned to Kumamoto City)	Kumamoto Prefecture Statistical Yearbook
92	Education	Number of persons engaged	Establishment and Enterprise Census
93	Research	Number of persons engaged	Establishment and Enterprise Census
94	Medical service and health	Number of persons engaged	Establishment and Enterprise Census
95	Social security	Number of persons engaged	Establishment and Enterprise Census
96	Nursing care	Number of persons engaged	Establishment and Enterprise Census
97	Other public services	Number of persons engaged	Establishment and Enterprise Census
98	Advertising services	Number of persons engaged	Establishment and Enterprise Census
99	Goods rental and leasing services	Number of persons engaged	Establishment and Enterprise Census
100	Repair of motor vehicles and machine	Number of persons engaged	Establishment and Enterprise Census
101	Other business services	Number of persons engaged	Establishment and Enterprise Census
102	Amusement and recreational services	Number of persons engaged	Establishment and Enterprise Census
103	Eating and drinking places	Number of persons engaged	Establishment and Enterprise Census
104	Accommodations	Number of persons engaged	Establishment and Enterprise Census
105	Cleaning, barber shops, beauty shops and public baths	Number of persons engaged	Establishment and Enterprise Census
106	Other personal services	Number of persons engaged	Establishment and Enterprise Census
107	Office supplies	Number of employed persons	Population Census
108	Activities not elsewhere classified	Number of employed persons	Population Census
F1	Private consumption expenditures	Number of households	Population Census
F2	General government consumption expenditures	Amount of expenditure in municipal general account settlement	Account Settlement Card

Inflow and outflow can be expressed by formulas (14) and (15) on the basis of the total value of inter-regional trade according to counterparty. For example, the outflow from the Kumamoto urban area into the other areas of Kumamoto is the total input from the Kumamoto urban area to the intermediate demand and final demand in the other areas of Kumamoto, as shown in Figure 1. The inflow into the other areas of Kumamoto from the Kumamoto urban area is the opposite of this as viewed from the perspective of the other areas of Kumamoto.

$$n_i^k = \sum_l t_i^{lk} \qquad (14)$$

$$h_i^k = \sum_l t_i^{kl} \qquad (15)$$

Wherein n_i^k is the inflow into sector i of region k; h_i^k is the outflow from sector i of region k; and t_i^{kl} is the outflow from sector i of region k into the same sector of region l (which also represents the inflow into region l from region k).

These factors are inadequate to allow inflow/outflow to be estimated by region or sector. Therefore, a gravity model has been used to divide outflow by region according to the method employed by Nakano and Nishimura (2012). The outflow from region k into region l is assumed to be as indicated in formula (16). It is determined based on the regional production in region k, which represents the region's supply capacity, the total regional demand in region l, which represents the scale of demand in the region, the distance between these regions, and the per-capita gross value added, which is a wealth indicator for households in region l.

$$\ln t_i^{kl} = \alpha + \beta \ln x_i^k + \gamma \ln y_i^l + \delta \ln d^{kl} + \kappa \ln p^l + u_i^{kl} \qquad (16)$$

Wherein x_i^k is the regional production in sector i of region k; y_i^l is the total regional demand in sector i of region k $\left(y_i^l = \sum_j x_{ij}^l + f_i^l \right)$; d^{kl} is the distance between regions k and l; p^l is the per-capita gross value added in region l; and u_i^{kl} is a disturbance term.

The ratio between the value of the inflow in sector i from region k into region l and that from region k into region m can be expressed by formula (17).

$$\ln \frac{t_i^{kl}}{t_i^{km}} = \gamma \ln \frac{y_i^l}{y_i^m} + \delta \ln \frac{d^{kl}}{d^{km}} + \kappa \ln \frac{p^l}{p^m} + u_i^{kl} - u_i^{km} \qquad (17)$$

In this formula, if the parameters γ, δ, and κ are determined, inflow and outflow can be calculated for each region. The inter-regional distance applied here is the population-weighted average distance[12] between region k and region l, which is defined by formula (18), where a is a city in region k ($a \in k$) and the distance between city a and city b ($b \in l$) is d^{kl}.

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[12] Some studies use the physical distance between the populated cities in the target regions or the physical distance between the points of intersection of the diagonal lines of the rectangles that encompass the target regions (Ihara 1996). Another alternative is economic distance that takes into account traveling time, transportation costs, etc. (internal data compiled by the Measurement Section of the Planning Bureau of the Economic Planning Agency, cited by Kaneko [1967]). The distance metric adopted in this study is something of a hybrid between these types.

Table 3. Population-Weighted Average Distance Employed to Estimate Parameters

(Unit: day)

	Hokkaido	Tohoku	Kanto	Chubu	Kinki	Chugoku	Shikoku	Kyushu
Hokkaido								
Tohoku	0.574							
Kanto	0.738	0.184						
Chubu	0.889	0.339	0.215					
Kinki	0.983	0.433	0.275	0.124				
Chugoku	1.113	0.561	0.403	0.253	0.152			
Shikoku	1.146	0.601	0.444	0.293	0.186	0.122		
Kyushu	1.296	0.744	0.586	0.436	0.335	0.138	0.284	

Note: Calculated by the author based on the 2005 Population Census (MIC) using the Google
Map route search service.

$$d^{kl} = \sum_{b \in l} \sum_{a \in k} \frac{p_a p_b}{\sum_{b \in l} \sum_{a \in k} p_a p_b} d^{ab} \qquad (18)$$

Wherein p_a is the population in city a and p_b is the population in city b.

In this study, the 2005 Inter-Regional Input-Output Tables compiled by the Ministry
of Economy, Trade and Industry (METI) have been used to estimate the parameters. These
tables represent inter-regional input-output data including cross hauling, and divide the en-
tire area of Japan into nine regions: Hokkaido, Tohoku, Kanto, Chubu, Kinki, Chugoku,
Shikoku, Kyushu, and Okinawa. When calculating the inter-regional distance, the three
most populous cities are selected for each region (with the exception of Okinawa), and the
distance between these selected cities is calculated on the basis of the time distance between
the locations of their city halls using the Google Map route search service.[13] The distances
between the regions are as indicated in Table 3.

In this study, formula (17) has been estimated using a Tobit model, using the outflow
and gross regional demand provided in the 2005 Inter-Regional Input-Output Tables as well
as the regional distance indicated in Table 3. The estimation results are as indicated in Table
4. A one-to-one concordance does not exist for all sectors between the multi-regional in-
put-output tables for the Kumamoto urban area (which this study attempts to estimate) and
the Inter-Regional Input-Output Tables compiled by METI because the level of aggregation
by sector is higher in the METI tables. Accordingly, if two or more sectors in the in-
put-output tables estimated in this study correspond to a given sector in the METI tables, a
common parameter is applied to these sectors.

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[13] Although this study adopts time distance measured by car travel, it is possible to use data related
to other forms of transportation, such as trains.

Table 4. Results of Estimation Using a Tobit Model

	γ	δ	κ	σ	Log likelihood	Sample size
Agriculture, forestry, fisheries	0.808	1.238	1.954	0.875	-141.585	168
	(0.095)***	(0.125)***	(0.498)***	(0.062)***		
Mining	-0.632	1.094	6.686	1.472	-203.692	168
	(0.187)***	(0.183)***	(0.776)***	(0.107)***		
Coal mining , crude petroleum and natural gas	-1.347	-3.854	13.137	0.668	-6.704	9
	(1.136)	(3.669)	(10.143)	(0.224)***		
Foods and beverage	0.049	0.072	0.336	0.034	-69.130	168
	(0.000)***	(0.000)***	(0.877)***	(0.000)***		
Textile products	0.488	0.358	2.174	0.691	-92.622	150
	(0.071)***	(0.104)***	(0.461)***	(0.057)***		
Wearing apparel and other textile products	1.674	1.162	-2.812	1.206	-165.343	168
	(0.150)***	(0.160)***	(0.968)***	(0.083)***		
Timber and wooden products/furniture	1.631	1.210	-1.506	0.919	-131.634	168
	(0.123)***	(0.135)***	(0.688)**	(0.067)***		
Pulp, paper, paperboard, building paper	1.095	1.024	0.818	0.938	-139.021	168
	(0.127)***	(0.135)***	(0.733)	(0.068)***		
Printing, plate making and book binding	0.652	1.349	4.383	1.837	-194.398	168
	(0.168)***	(0.244)***	(1.343)***	(0.143)***		
Basic chemical products	0.512	1.385	1.110	1.332	-152.434	162
	(0.184)***	(0.210)***	(1.286)	(0.104)***		
Synthetic resins	0.833	0.272	-0.872	0.832	-102.240	147
	(0.079)***	(0.122)**	(0.779)	(0.066)***		
Final chemical products	0.874	0.616	-1.769	0.757	-118.587	168
	(0.067)***	(0.103)***	(0.601)***	(0.053)***		
Medicaments	0.447	0.216	0.477	0.562	-103.249	168
	(0.054)***	(0.070)***	(0.383)	(0.045)***		
Petroleum/coal products	1.015	2.710	-0.925	2.740	-241.578	168
	(0.340)***	(0.384)***	(2.448)	(0.198)***		
Plastic products	0.472	1.076	0.805	0.826	-122.637	168
	(0.052)***	(0.125)***	(0.526)	(0.062)***		
Ceramic, stone and clay products	1.442	1.466	-2.086	1.219	-156.047	168
	(0.143)***	(0.179)***	(0.844)**	(0.087)***		
Iron and steel	0.711	1.133	0.820	1.245	-154.114	168
	(0.075)***	(0.180)***	(0.772)	(0.090)***		
Non-ferrous metals	0.720	0.543	1.643	0.998	-144.709	168
	(0.068)***	(0.140)***	(0.598)***	(0.073)***		
Metal products	0.869	1.474	-0.412	1.218	-154.392	162
	(0.104)***	(0.180)***	(0.840)	(0.087)***		
General machinery	0.714	0.378	0.213	0.641	-99.496	168
	(0.054)***	(0.091)***	(0.439)	(0.047)***		
Machinery for office and service industry	0.605	0.285	2.446	1.625	-173.042	141
	(0.081)***	(0.190)	(1.092)**	(0.124)***		
Electrical devices and parts	0.625	0.564	2.116	0.733	-113.112	162
	(0.046)***	(0.101)***	(0.434)***	(0.053)***		
Other electrical equipment	0.984	0.047	-0.636	0.738	-113.196	162
	(0.081)***	(0.093)	(0.633)	(0.055)***		
Household electric appliances	0.791	0.360	-1.371	1.113	-136.390	150
	(0.095)***	(0.139)***	(0.897)	(0.086)***		
Household electronics equipment	0.713	0.097	-0.525	0.502	-90.018	168
	(0.047)***	(0.061)	(0.416)	(0.036)***		
Electronic computing equipment and accessory equipment of electronic computing equipment	0.877	0.178	2.213	1.996	-151.816	112
	(0.226)***	(0.258)	(1.772)	(0.182)***		

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Table 4 (*Continued*)

	γ	δ	κ	σ	Log likelihood	Sample size
Electronic components	0.550	-0.340	3.098	1.009	-159.820	168
	(0.053)***	(0.114)***	(0.563)***	(0.074)***		
Passenger motor cars	0.669	0.207	-0.186	0.512	-58.736	126
	(0.048)***	(0.076)***	(0.459)	(0.043)***		
Other cars	0.052	-0.099	2.013	1.281	-168.611	136
	(0.100)	(0.141)	(1.313)	(0.103)***		
Motor vehicle parts and accessories	0.695	0.731	-1.599	1.349	-146.779	162
	(0.044)***	(0.185)***	(0.811)**	(0.108)***		
Other transportation equipment	0.641	0.828	1.039	1.390	-185.800	168
	(0.126)***	(0.166)***	(0.919)	(0.104)***		
Precision instruments	1.140	0.663	-2.481	1.038	-147.349	168
	(0.102)***	(0.132)***	(0.782)***	(0.074)***		
Miscellaneous manufacturing products	1.129	0.745	-1.582	1.058	-151.306	168
	(0.097)***	(0.140)***	(0.753)**	(0.075)***		
Reuse and recycling	0.330	1.387	5.618	2.353	-250.335	156
	(0.182)*	(0.298)***	(1.431)***	(0.162)***		
Construction	1.019	0.857	-2.445	1.243	-170.943	168
	(0.149)***	(0.156)***	(0.876)***	(0.095)***		
Electricity	0.952	2.154	10.640	2.286	-215.020	162
	(0.297)***	(0.316)***	(1.559)***	(0.167)***		
Gas and heat supply	0.424	0.979	-1.344	1.650	-216.530	162
	(0.111)***	(0.197)***	(1.038)	(0.116)***		
Water supply and management	0.136	1.268	-3.739	1.450	-167.249	151
	(0.179)	(0.205)***	(1.083)***	(0.113)***		
Commerce	0.510	0.823	0.375	0.305	-26.818	168
	(0.026)***	(0.049)***	(0.223)*	(0.022)***		
Finance and insurance	1.189	-0.266	-1.707	1.365	-226.027	168
	(0.145)***	(0.132)**	(0.961)*	(0.088)***		
Real estate	0.891	1.857	-5.029	2.315	-209.767	168
	(0.239)***	(0.309)***	(1.788)***	(0.186)***		
Transport	1.159	1.058	-1.176	0.621	-93.463	168
	(0.076)***	(0.094)***	(0.513)**	(0.044)***		
Other information and communications services	0.861	1.247	0.408	1.003	-139.861	168
	(0.115)***	(0.153)***	(0.812)	(0.073)***		
Information services	0.999	1.807	2.495	2.021	-178.754	151
	(0.193)***	(0.290)***	(1.833)	(0.160)***		
Education and research	1.104	1.162	-0.410	1.011	-143.339	168
	(0.119)***	(0.148)***	(0.730)	(0.073)***		
Medical service and health/ social security/nursing care	1.882	1.826	3.304	1.207	-150.122	157
	(0.184)***	(0.188)***	(0.822)***	(0.086)***		
Advertising services	0.593	1.533	-1.496	0.831	-112.518	168
	(0.058)***	(0.139)***	(0.617)**	(0.065)***		
Goods rental and leasing services	0.244	0.820	1.465	0.556	-92.335	168
	(0.045)***	(0.085)***	(0.383)***	(0.040)***		
Other business services	0.827	1.211	-1.583	1.064	-149.791	168
	(0.101)***	(0.154)***	(0.761)**	(0.078)***		
Personal services	1.043	2.077	0.978	1.064	-140.393	168
	(0.110)***	(0.170)***	(0.774)	(0.080)***		

Notes: 1. Figures in parentheses are standard errors.
2. Level of statistical significance: *** at 1%, ** at 5%, and * at 10%.

Table 5. Population-Weighted Average Distance Employed to Estimate Inflow/Outflow

(unit: day)

	Kumamoto urban area	Other areas of Kumamoto	Other areas of Japan
Kumamoto urban area			
Other areas of Kumamoto	0.038		
Other areas of Japan	0.591	0.600	

Note: Calculated by the author based on the 2005 Population Census (MIC) and using the Google Map route search service

According to formulas (13) to (15), as well as formula (17) which uses estimated parameters, inflow and outflow for each region are estimated. The inter-regional distances used in this estimate are as indicated in Table 5.

3. Consideration of Employment Coefficients

In order to estimate the number of employees or number of employed persons at work by sector in accordance with multi-regional input-output tables focused on the Kumamoto urban area, this study uses the employment tables supplemented to the existing input-output tables. In this study, the value of trade in the input-output tables has been estimated on the assumption that the production technology (the input coefficient and the rate of gross value added) applied to each sector is the same in all areas in Kumamoto Prefecture. Accordingly, it may be possible to consider the number of employees or employed persons at work necessary for a unit of production (employment coefficient) to be the same in all areas, and thus, it may make sense to use the publicly available employment tables.[14]

Specifically, the employment tables appended to the Input-Output Tables for Japan and those appended to the Input-Output Tables for Kumamoto Prefecture have been used. For both the Kumamoto urban area and the other areas of Kumamoto, the employment coefficient according to sector calculated based on the employment tables of the Input-Output Tables for Kumamoto Prefecture have been used. The number of employees (employed persons at work) according to sector for areas of Japan other than Kumamoto Prefecture is obtained by deducting the data in the employment tables of the Input-Output Tables for Kumamoto Prefecture from the data in the employment tables of the Input-Output Tables

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[14] Another approach would be to use the Population Census compiled by MIC, considering that it is relatively easy to compare this data set with other labor statistics and that this data set is capable of accurately indicating labor administration. As this study based its estimates on the Population Census as well, any person who needs the relevant information may feel free to inquire of the author. Nakano (2011) explains the method used to estimate the employment tables in accordance with the input-output tables through an approach compatible with the Population Census, although the targeted regions were the regional blocks governed by the bureaus of economy, trade and industry, which are larger than the regions targeted in this study.

for Japan. This estimation method is simple and clear, and also consistent with the concept of input-output tables compiled on the basis of activity, but it has two problems. The first is that the level of aggregation by sectoral classification is somewhat higher in the employment tables of the Input-Output Tables for Kumamoto Prefecture. While the value of trade tables—the most detailed of the publicly available tables among the Input-Output Tables for Kumamoto Prefecture—are divided into 108 sectors, the publicly available employment tables have 33 sectors. Accordingly, the amount of induced production estimated separately for the 108 sectors is first aggregated into the 33 sectors and then multiplied by the sectoral employment coefficient, which could result in reducing the amount of information initially obtained. Another problem is double counting of the number of persons in the employment tables. When the number of employees or employed persons at work is aggregated in the employment tables, a single person who is engaged in two or more production activities is counted in each of the sectors in which he/she is engaged in accordance with the concept of activity, thus resulting in double counting. As a result, the amount of induced employment is likely to exceed the actual labor demand when it is measured by means of the employment coefficient calculated based on the publicly available employment tables.

The employment coefficient calculated by sector is indicated in Table 6.[15]

IV. Simulations of Employment Inducement[16]

1. Induced Employment per Unit of Regional Final Demand

It may be possible to estimate the amount of induced employment by means of formulas (6) and (7) for each policy or plan to be evaluated. However, if the amount of induced employment per unit of regional final demand according to sector (per one million yen) is calculated beforehand, it is possible to measure the amount of induced employment as necessary by a simple method; by multiplying the amount of investment according to

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[15] Based on the employment tables appended to the input-output tables, the employment coefficient for areas of Japan other than Kumamoto Prefecture is estimated by dividing the number of employees (employed persons at work) for the 105 sectors in the nationwide input-output tables by the amount of domestic production. The amount of induced employment is measured by first calculating the amounts separately for the 105 sectors and then aggregating the amounts into the 33 sectors used in the publicly available employment tables.

[16] To understand the amount of induced employment estimated by the method discussed in this subsection, attention should be paid to the following two points. The first point relates to the number of working hours. When production activities are induced, enterprises do not immediately increase employment; they first increase the number of hours of overtime work for their current workforces. The second point is that the amount of induced employment increases with final demand, which in turns increases expenses, and if the increased expenses are to be covered by public funds, the fiscal balance should be taken into consideration. The author has provided a simple estimate of the increased tax revenues arising from the increase in final demand. Any person who needs the relevant information may feel free to inquire of the author.

Table 6. Employment Coefficient by Sector

(unit: person / million yen [valued at 2005 producer prices])

Input-output tables for Kumamoto Prefecture, based on employment tables

	Employed persons at work	Employees (incl. paid executives)	Employees (excl. paid executives)
Agriculture, forestry, fisheries	0.300	0.034	0.030
Mining	0.036	0.036	0.031
Foods and beverage	0.045	0.042	0.039
Textile products	0.181	0.154	0.147
Pulp, paper, paperboard, building paper	0.045	0.037	0.033
Chemical products	0.032	0.032	0.031
Petroleum/coal products	0.026	0.026	0.024
Ceramic, stone and clay products	0.070	0.067	0.062
Iron and steel	0.025	0.024	0.023
Non-ferrous metals	0.028	0.028	0.027
Metal products	0.057	0.054	0.052
General machinery	0.026	0.026	0.025
Other electrical equipment	0.045	0.042	0.040
Information and communications equipment	0.065	0.064	0.063
Electronic components	0.047	0.046	0.046
Transportation equipment	0.024	0.023	0.023
Precision instruments	0.047	0.047	0.043
Miscellaneous manufacturing products	0.053	0.047	0.044
Construction	0.119	0.095	0.079
Electricity/gas and heat supply	0.013	0.013	0.013
Water supply and management	0.071	0.069	0.064
Commerce	0.203	0.173	0.157
Finance and insurance	0.047	0.043	0.041
Real estate	0.011	0.008	0.005
Transport	0.064	0.059	0.056
Information and communications services	0.042	0.040	0.038
Public administration	0.065	0.065	0.065
Education and research	0.077	0.077	0.076
Medical service and health/social security/nursing care	0.124	0.118	0.114
Other public services	0.122	0.107	0.080
Business services	0.128	0.102	0.094
Personal services	0.159	0.132	0.124
Office supplies	0.000	0.000	0.000
Activities not elsewhere classified	0.011	0.010	0.009

Note: Calculated by the author based on the Input-Output Tables for Kumamoto Prefecture.

sector by the amount of induced employment per unit, for example.[17] In addition, through comparison of the amounts of induced employment per unit in different sectors, it is possible to see which sector has an advantage in inducing employment in the region.

From this standpoint, the amount of induced employment per unit of regional final demand according to sector is indicated in Supplementary Tables 1 and 2. Supplementary Table 1 (pp. 131–33) shows the amount of employment induced by one unit of regional final demand according to sector generated in the Kumamoto urban area, according to employment status (employees/employed persons at work) and according to region (Kumamoto urban area/other areas of Kumamoto/areas of Japan other than Kumamoto Prefecture). Supplementary Table 2 (pp. 134–36) shows the amount of employment induced by one unit of regional final demand according to sector generated in the other areas of Kumamoto. Specifically, these tables can be read as follows. When one unit of demand for general industrial machinery is generated by plant and equipment investment in the Kumamoto urban area, it induces employment for 0.048 persons (employees other than paid executives) in the Kumamoto urban area, while at the same time inducing employment for 0.001 persons in the other areas of Kumamoto and 0.039 persons in areas of Japan other than Kumamoto Prefecture, leading to a total induced employment for 0.089 persons nationwide.

2. Target for Employment Inducement through Invitation of Enterprises

When an enterprise is invited to move to Kumamoto Prefecture, a location agreement is reached among the enterprise, Kumamoto Prefecture, and the municipality that governs the location of the enterprise's new business establishment, and the target number of new employees and the target amount of investment to be induced are determined. As these figures are set as targets, they do not always coincide with the actual figures, but they at least provide a rough estimate of the scale of the invited enterprise. Table 7 shows the number of enterprises recently invited to move to Kumamoto Prefecture and their target numbers of new employees and target amounts of investment.

This subsection describes the measurement of the amount of employment induced by the successful invitation of enterprises in the Kumamoto urban area, which is roughly divided into two types: employment induced by plant and equipment investment which is a temporary factor such as construction demand, and employment induced by ordinary production activities.

The factor to be used to estimate the amount of the former type of induced employment is the average target amount of investment induced by the invitation of enterprises over approximately the past ten years (Table 7). Since most manufacturing establishments which have moved to Kumamoto Prefecture are related to semiconductors and transportation equipment, it is assumed that multiple manufacturers of semiconductor-making equipment

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[17] To be precise, if the amount of final demand is indicated by the purchaser price rather than the producer price, it needs to be converted into an amount based on the producer price.

Table 7. Number of Enterprises Recently Invited to Move to Kumamoto Prefecture

FY	Number of invited enerprises	Planned number of new employees (persons)	Planned amount of investment (million yen)
1998	7	362	5,221
1999	11	1,432	8,002
2000	14	1,909	26,674
2001	10	974	8,589
2002	7	122	4,500
2003	7	172	4,330
2004	17	733	62,742
2005	22	718	83,182
2006	40	2,496	179,741
2007	35	1,424	141,854
2008	18	3,101	87,096
2009	17	573	19,615
2010	22	735	80,512
2011	27	718	92,795
Average	18	1,105	57,490

Source: Enterprise Location Division, New Industry Promotion Bureau, Commerce, Manufacturing and Tourism Department, Kumamoto Prefecture.

Notes: 1. The numbers include both new establishments and expansions of existing establishments.
2. The data for FY2011 is as of the end of December 2011.

make the same amounts of plant and equipment investment as the average target amount of investment. As the average target amount of investment shown in Table 7 is the total amount of investment, it needs to be divided by type of goods for this measurement. Semiconductor-making equipment, which is taken as an example, is classified as special industrial machinery in the input-output tables estimated in this study. Accordingly, the distribution ratio according to type of investment goods is calculated in relation to an investor which belongs to the special industrial machinery sector in the fixed capital matrix (private) supplemented to the nationwide input-output tables, and the total amount of investment is multiplied by this ratio.[18] The amount of induced employment can be measured by assigning the amount of plant and equipment investment thus calculated according to type of investment goods to formulas (6) and (7) or by multiplying this amount by the amount of induced employment per unit shown in Supplementary Tables 1 and 2.

To estimate the amount of employment induced by ordinary production activities carried out at an establishment invited to move to a certain region, information concerning the scale of such production activities is a prerequisite factor. However, it is difficult to estimate

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[18] Using the distribution ratio of a fixed capital matrix means assuming the national average of investment activities carried out in the investor's sector in 2005, including construction of new establishments and expansions of existing establishments. The description given here does not assume any specific investment project because it only provides an example of calculation. If the amount of investment according to type of investment goods is known, such data can be used for calculation.

the value of production to be generated from such activities at an establishment not yet in operation, irrespective of whether it is newly constructed or an expansion of an existing establishment.[19] Therefore, the amount of induced employment is estimated by calculating the value of shipments per establishment which has already moved to Kumamoto Prefecture and then multiplying this value by the average number (18) of invited enterprises as shown in Table 7. According to the preliminary data from 2010 Census of Manufactures compiled by METI, 255 manufacturing establishments were invited to move to Kumamoto Prefecture and the total shipments of these establishments amounted to 1.544 trillion yen.[20] The value of shipments per establishment may depend on the industry or scale of the establishment. The average for the manufacturing industry as a whole is used here as an approximation. The estimated value of production is determined by compiling all of this data, but this value cannot immediately be assigned to the model defined in Section II because production, unlike investment, is not final demand. Therefore, this study employs a simple calculation method generally adopted by prefectures, in which an inverse matrix is modified to make the sector subject to estimation exogenous (excluding the indirect influence of other sectors).[21] Specifically, the value of production relating to the production activities carried out in a given region and sector is estimated by: (i) extracting a row for the region and sector from the inverse matrix represented by formula (3) (for example, special industrial machinery in the Kumamoto urban area); (ii) dividing the inverse matrix coefficients listed in this row by the factor for the region and sector; and (iii) multiplying the results by the estimated value of production (in special industrial machinery). Finally, the amount of employment induced by ordinary production activities can be estimated by multiplying the value of production by region and sector by the employment coefficient.

 Table 8 shows the amount of employment induced by semiconductor-making equipment manufacturing establishments invited to move to the Kumamoto urban area, as estimated through the abovementioned process. In the Kumamoto urban area, where business establishments have been constructed as a result of investment activities, employment of about 4,380 persons (excluding paid executives) is induced, and by way of the repercussions between regions, this leads to induced employment of about 170 persons in the other areas of Kumamoto and of about 1,860 persons in areas of Japan other than Kumamoto Prefecture, respectively. On the other hand, ordinary production activities in the Kumamoto urban area induced employment of about 6,870 persons in the Kumamoto urban area, about

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 [19] Naturally, enterprises specify the production scale they intend to achieve by means of the plant and the equipment to be constructed in their investment plans. If this information is available beforehand, a more precise estimate will be possible. However, it should be noted that how the new or expanded plant and equipment will actually be operated is uncertain at the time of estimation.
 [20] Data published by the Enterprise Location Division, New Industry Promotion Bureau, Commerce, Manufacturing and Tourism Department, Kumamoto Prefecture.
 [21] For examples, see the reference published by Miyazaki Prefecture, titled "Plain Input-Output Analysis: Case Analysis Using Simple Analytical Data (in Japanese)," available at:
http://www.pref.miyazaki.lg.jp/contents/org/honbu/toukei/sangyo/tebikisyo.html.

Table 8. Amount of Employment Induced by Semiconductor-Making Equipment Manufacturing Establishments Invited to Move to the Kumamoto Urban Area

(unit: person [number of employees, excluding paid executives])

	Investment				Ordinary production			
	Kumamoto urban area	Other areas of Kumamoto	Other areas of Japan	Total	Kumamoto urban area	Other areas of Kumamoto	Other areas of Japan	Total
Agriculture, forestry, fisheries	2	3	2	6	4	5	3	12
Mining	1	1	2	4	1	1	4	5
Foods and beverage	0	0	1	2	2	1	3	6
Textile products	16	10	8	35	50	17	15	81
Pulp, paper, paperboard, building paper	12	6	29	47	13	4	30	47
Chemical products	4	1	13	19	18	6	33	57
Petroleum/coal products	0	1	3	3	0	2	5	6
Ceramic, stone and clay products	14	4	18	36	15	4	18	36
Iron and steel	24	0	77	100	77	0	146	223
Non-ferrous metals	8	0	26	35	26	0	43	69
Metal products	33	1	96	129	69	2	191	261
General machinery	545	0	203	749	2,867	0	105	2,972
Other electrical equipment	100	51	255	407	46	10	103	158
Information and communications equipment	0	10	10	20	0	0	1	1
Electronic components	35	17	62	114	97	9	13	120
Transportation equipment	6	0	48	53	5	0	11	17
Precision instruments	12	0	36	48	8	0	24	32
Miscellaneous manufacturing products	26	20	112	158	73	98	252	422
Construction	336	1	19	356	37	2	23	62
Electricity/gas and heat supply	1	7	11	18	1	19	20	40
Water supply and management	7	1	5	14	21	4	6	31
Commerce	2,245	14	210	2,469	1,399	13	200	1,612
Finance and insurance	98	2	41	141	149	3	46	198
Real estate	3	0	10	13	5	0	8	13
Transport	173	8	90	272	266	12	119	397
Other information and communications services	91	0	96	188	114	0	82	196
Public administration	0	0	3	3	0	0	3	3
Education and research	153	2	72	226	877	1	45	923
Medical service and health/social security/nursing care	0	0	0	0	1	0	0	1
Other public services	7	2	5	14	29	8	5	41
Business services	420	9	287	715	585	12	279	875
Personal services	6	0	5	11	12	0	6	18
Office supplies	0	0	0	0	0	0	0	0
Activities not elsewhere classified	2	0	1	3	9	0	1	10
Total	4,382	171	1,855	6,408	6,873	235	1,840	8,947

Note: Compiled by the author based on the assumptions given in Section IV, using the multi-regional input-output tables and employment coefficients estimated in this study.

240 persons in the other areas of Kumamoto, and about 1,840 persons in areas of Japan other than Kumamoto Prefecture.

3. Increase in Demand in Growth Fields

The New Growth Strategy decided on by the cabinet on June 18, 2010, has selected fields with growth potential, such as "environment," "health," "Asia," and "tourism," and has set medium-term targets for the market size and number of jobs to be created in these respective fields. As these targets are set on a nationwide basis, Nakano (2011) estimated the target potential for employment inducement according to regional block and also according to prefecture in a simpler version. This study attempts more detailed, municipal-level estimates, for areas such as the Kumamoto urban area and the other areas of Kumamoto, focusing on the environmental- and health-related fields.

(1) Environmental-Related Field

The national target for this field is to create over 50 trillion yen in new environmental-related markets by 2020. As was done by Nakano (2011), this study estimates the market size in this field according to the sector classifications in the input-output tables and divides it into three regions and 108 sectors subject to analysis. The national target is set without taking into account any decrease in final demand for products manufactured using conventional technology due to the replacement with products manufactured using newly introduced technology. As a reference value, this study also estimates the amount of induced employment while taking into account the negative impact of such a replacement of products. The indicators for proportional distribution for division according to region and sector are as indicated in Table 9. With regard to the potential for the introduction of renewable energy, only data for Kumamoto Prefecture as a whole is available. Therefore, this data is divided and assigned evenly to the Kumamoto urban area and the other areas of Kumamoto.[22]

The estimated final demand without taking into account the negative impact of the replacement of products is about 330 billion yen in the Kumamoto urban area, about 170 billion yen in the other areas of Kumamoto, and about 49.49 trillion yen in areas of Japan other than Kumamoto Prefecture. With this impact taken into account, the estimated final demand is about 150 billion yen in the Kumamoto urban area, about 120 billion yen in the other areas of Kumamoto, and about 26.73 trillion yen in areas of Japan other than Kumamoto Prefecture.

(2) Health-Related Field (Medical and Nursing Care)

With regard to the health-related field, which consists of medical and nursing care, health services, and state-of-the-art medical technology, the national target is to create 50

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[22] With regard to geothermal power generation, the data for Kumamoto Prefecture as a whole has been assigned to areas of Kumamoto other than the urban area, where Kurokawa Hot Spring is located.

Table 9. Indicators for Proportional Distribution to Divide the Size of New Markets (Final Demand) in the Environmental Field

Sector	Indicator for proportional distribution	Data source
Industry/non-energy	Production and export, by sector	Multi-regional input-output tables compiled in this study

Household
  Air conditioning/ lighting
  Hot water supply
	Private consumption expenditures on household electric appliances
	Private consumption expenditures on other metal products	

Commercial
  Air conditioning/ lighting
 	
  Hot water supply
	Gross domestic fixed capital formation (private) in household electric appliances
	Gross domestic fixed capital formation (private) in other metal products	

Transport
  Non-infrastructure-related
 	
  Infrastructure-related
	Private consumption expenditures on and gross domestic fixed capital formation (private) in passenger motor cars and other cars
	Gross domestic fixed capital formation (public) in public construction	

Household
  Solar power generation
  Housing-related
	Number of dwellings by municipality	MIC, *2008 Dwellings and Land Survey*

Commercial
  Solar power generation
 	
New energy
  Excl. biomass
	Potential for the introduction of renewable energy	Ministry of the Environment, *Report on the 2009 Study of Potential for the Introduction of Renewable Energy (2010)* Kumamoto Prefecture, *Estimated Population Survey Report* METI, *Census of Manufacturers*

Commercial Building-related	Floor area of non-residential buildings in Kumamoto Prefecture, proportionally distributed according to population, product shipment, etc. by municipality	
New energy Biomass	Land area available for producing and harvesting biomass resources in Kumamoto Prefecture, proportionally distributed according to forest area by municipality and type of ownership	Mechanical Social Systems Foundation, *Summary of the Research Report on Promising Scenarios for Innovative Biomass Utilization Systems (2008)* Kumamoto Prefecture, *Statistical Yearbook*

trillion yen in new markets by 2020, of which the medical and nursing care markets will amount to 37 trillion yen. Final demand is divided between medical and nursing care in accordance with the ratio between the costs for medical and nursing care as of 2025 based on the B2 Scenario in the Simulations of Medical and Nursing Care Costs for Discussions at the National Council on Social Security,[23] thereby estimating final demand for each of the three regions subject to analysis. Medical and nursing care costs are estimated according to region using the estimation approach employed in creating the abovementioned simulations using the data on population projections according to municipality extracted from the Population Projections for Japan by Municipality, compiled by the National Institute of Population and Social Security Research (December 2008). The estimated final demand is about 310 billion yen in the Kumamoto urban area, about 250 billion yen in the other areas of Kumamoto, and about 36.44 trillion yen in areas of Japan other than Kumamoto Prefecture.

Table 10 shows simulation results of employment inducement based on the target sizes of the new markets specified in the New Growth Strategy. The amount of induced employment (excluding paid executives) in the environmental field (without replacement of products) is about 10,000 persons in the Kumamoto urban area, about 5,000 persons in the other areas of Kumamoto, and about 1,385,000 persons in areas of Japan other than Kumamoto Prefecture. The amount in the Kumamoto urban area and the other areas of Kumamoto accounts for about 2% of the total number of employees in 2005 (including paid executives).[24] Even in the same environmental field, regional differences can be observed in relation to sectors where a large amount of employment is induced, depending on industrial structure or final demand structure.

The amount of induced employment estimated as a reference value taking into account the negative impact of the replacement of products manufactured using conventional technology is about 6,000 persons in the Kumamoto urban area, about 3,000 persons in the other areas of Kumamoto, and about 739,000 persons in areas of Japan other than Kumamoto Prefecture—nearly half the amount estimated without such replacement. The amount is smaller in transportation equipment, but is large in sectors such as construction and electrical machinery with or without such replacement.

The amount of induced employment in the field of medical and nursing care is about 26,000 persons in the Kumamoto urban area, about 13,000 persons in the other areas of Kumamoto, and about 2,569,000 persons in areas of Japan other than Kumamoto. The amount in the Kumamoto urban area and the other areas of Kumamoto accounts for about 5% of the number of employees in 2005 (including paid executives).

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[23] Using the B2 Scenario, estimation results are provided based on multiple assumptions. In this study, by calculating a simple average of these results, it is found that medical care costs are about 2.8 times those in relation to nursing care.

[24] The unemployment rate may be used as an indicator to understand this value. According to the model estimates by prefecture based on the Labor Force Survey compiled by MIC, the unemployment rate in Kumamoto Prefecture was 4.5% in 2005 and 4.8% in 2010.

Table 10. Amount of Induced Employment According to Sector, Estimated Based on the Target Sizes of the New Markets Specified in the New Growth Strategy

(unit: person [number of employees, excluding paid executives])

Sector	Environment (without replacement of products)				Medical and nursing care				(Reference) Environment (with replacement of products)			
	Kumamoto urban area	Other areas of Kumamoto	Other areas of Japan	Total	Kumamoto urban area	Other areas of Kumamoto	Other areas of Japan	Total	Kumamoto urban area	Other areas of Kumamoto	Other areas of Japan	Total
Agriculture, forestry, fisheries	6	16	711	733	63	108	6,519	6,690	3	10	444	457
Mining	4	19	1,094	1,117	0	2	192	194	3	16	938	957
Foods and beverage	2	2	181	185	120	79	14,667	14,866	1	1	99	102
Textile products	18	39	3,274	3,331	56	88	3,759	3,903	10	24	1,692	1,726
Pulp, paper, paperboard, building paper	21	75	10,348	10,443	33	86	12,116	12,235	13	50	6,648	6,710
Chemical products	35	22	5,118	5,175	361	170	43,704	44,235	16	10	2,837	2,863
Petroleum/coal products	0	3	541	544	0	2	318	320	0	2	288	290
Ceramic, stone and clay products	265	171	19,374	19,810	14	18	2,535	2,567	136	157	16,825	17,117
Iron and steel	29	3	13,950	13,983	2	0	886	889	12	2	5,656	5,670
Non-ferrous metals	21	21	7,505	7,547	5	2	948	954	11	15	4,442	4,468
Metal products	167	230	57,476	57,873	14	27	5,572	5,614	72	112	19,464	19,647
General machinery	61	8	16,778	16,847	4	0	1,458	1,462	38	7	12,621	12,666
Other electrical equipment	151	521	69,388	70,060	2	6	488	496	91	417	56,997	57,505
Information and communications equipment	0	15	3,059	3,074	0	0	61	61	0	15	2,088	2,103
Electronic components	329	160	7,462	7,950	38	16	1,234	1,287	196	96	4,592	4,884
Transportation equipment	685	282	95,550	96,517	12	5	1,337	1,354	76	36	12,813	12,925
Precision instruments	1	0	474	474	20	0	4,591	4,611	0	0	233	233
Miscellaneous manufacturing products	156	266	47,508	47,930	97	117	20,450	20,664	86	138	28,004	28,228
Construction	664	475	68,855	69,994	53	32	11,364	11,449	653	469	64,358	65,480
Electricity/gas and heat supply	2	31	4,380	4,412	4	45	4,259	4,307	1	18	2,262	2,280
Water supply and management	29	33	6,807	6,869	110	84	11,807	12,000	16	18	3,612	3,646
Commerce	5,488	1,970	641,892	649,351	2,002	578	139,406	141,986	3,221	1,222	329,665	334,107
Finance and insurance	162	49	30,664	30,875	218	66	24,413	24,697	91	32	16,428	16,551
Real estate	6	2	9,470	9,478	9	3	7,813	7,825	4	1	5,028	5,033
Transport	358	211	70,987	71,556	426	228	38,655	39,310	211	141	36,663	37,015
Other information and communications services	191	16	29,940	30,146	203	15	27,345	27,563	126	12	16,920	17,058
Public administration	0	0	1,464	1,464	0	0	1,250	1,250	0	0	851	851
Education and research	449	29	32,715	33,193	121	7	22,171	22,299	211	18	17,322	17,550
Medical service and health/social security/nursing care	1	0	26	27	20,279	10,932	1,978,789	2,010,000	1	0	14	14
Other public services	11	10	2,263	2,285	34	30	3,998	4,062	6	6	1,231	1,243
Business services	588	197	122,917	123,702	1,024	308	144,714	146,047	344	137	66,602	67,082
Personal services	16	6	2,529	2,551	315	163	32,096	32,573	9	4	1,329	1,341
Office supplies	0	0	0	0	0	0	0	0	0	0	0	0
Activities not elsewhere classified	8	2	492	502	6	1	421	428	5	1	286	292
Total	9,925	4,884	1,385,191	1,400,000	25,644	13,220	2,569,335	2,608,199	5,660	3,188	739,247	748,095

Note: Compiled by the author based on the assumptions given in Section IV, using the multi-regional input-output tables and employment coefficients estimated in this study.

V. Conclusion

This study has attempted to develop and propose an approach for estimating regional input-output tables and simulate employment inducement through the use of such tables, as a tool to be used by relatively small local governments in drafting visions or comprehensive strategies for job creation incorporating specific numerical targets. As an example case, this study actually estimated multi-regional input-output tables for the Kumamoto urban area, which covers multiple municipalities, but the same approach can be applied when estimating input-output tables for a single municipality.[25] Thus, once input-output tables for a given region have been estimated and the corresponding employment tables compiled, the amount of induced employment can be measured by assigning the planned or expected data relating to final demand and production activities, such as investment and consumption, to an input-output model. In order to understand the estimation results, however, it is necessary to give due consideration to adjustment in terms of the number of working hours and the fiscal balance.

Although this study does not evaluate job creation measures, it may be possible to compare multiple such measures in terms of efficiency by calculating the ratio between their costs (final demand) and benefits (induced employment) taking their tax revenues into consideration. Considering that the amount of induced employment in a particular region is determined by the size and structure of final demand, with the industrial and technical structures of the region as given factors, it can provide clues during the process of exploring the job creation measures suitable for the region—that is, the size and structure of final demand achieved by these measures.

There may be an argument that the amount of employment that will be induced in the future cannot be estimated on the basis of current technical and industrial structures because new technologies or goods will become available. If it is possible to assume the cost structure of a new technology or the market structure for new goods in data form beforehand, that problem can be overcome by putting it into the rows and columns of the input-output tables estimated in this study. It may also be possible to deduce future structural changes from an economic model using these estimated tables as part of the data, but it would be difficult to obtain valid estimation results without choosing a technology based on the abovementioned information. A similar problem is the difficulty of estimating the level of future improvement in man-hour-based labor productivity. If basic data is unavailable, there would be no other way but to conduct a sensitivity analysis assuming multiple rates of change in productivity based on the historical data. How to link the static estimate achieved in this study to dynamic estimates is an issue that remains to be studied in the future.

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[25] What is more, while this study divides Japan into three regions—namely, the Kumamoto urban area and the other areas of Kumamoto and areas other than Kumamoto Prefecture—in order to make its estimates, further division may be possible.

Supplementary Table 1. Amount of Induced Employment per Unit of Regional Final Demand in the Kumamoto Urban Area, According to Sector

(Unit: person/million yen [valued at 2005 producer prices])

*Per 1 million yen of regional final demand in the Kumamoto urban area	No. of employed persons at work			No. of employees (excl. paid executives)		
	Kumamoto urban area	Other areas of Kumamoto	Other areas of Japan	Kumamoto urban area	Other areas of Kumamoto	Other areas of Japan
1 Crop cultivation	0.230	0.003	0.201	0.037	0.001	0.025
2 Livestock	0.255	0.173	0.080	0.042	0.027	0.024
3 Agricultural services	0.306	0.031	0.019	0.050	0.007	0.011
4 Forestry	0.200	0.121	0.005	0.029	0.017	0.003
5 Fisheries	0.093	0.215	0.023	0.019	0.033	0.013
6 Metallic ores	0.000	0.000	0.000	0.000	0.000	0.000
7 Non-metallic ores	0.054	0.048	0.013	0.045	0.040	0.011
8 Coal mining, crude petroleum and natural gas	0.000	0.000	0.012	0.000	0.000	0.011
9 Foods	0.063	0.056	0.117	0.032	0.019	0.050
10 Beverage	0.041	0.042	0.027	0.032	0.032	0.016
11 Feeds and organic fertilizer, n.e.c.	0.047	0.006	0.175	0.024	0.002	0.054
12 Tobacco	0.038	0.000	0.010	0.026	0.000	0.002
13 Textile products	0.160	0.002	0.068	0.124	0.001	0.045
14 Wearing apparel and other textile products	0.084	0.137	0.041	0.067	0.110	0.029
15 Timber and wooden products	0.044	0.101	0.006	0.020	0.033	0.005
16 Furniture and fixtures	0.053	0.009	0.070	0.039	0.003	0.052
17 Pulp, paper, paperboard, building paper	0.065	0.008	0.035	0.049	0.003	0.029
18 Paper products	0.015	0.009	0.089	0.011	0.006	0.072
19 Printing, plate making and book binding	0.071	0.001	0.041	0.057	0.001	0.033
20 Chemical fertilizer	0.024	0.001	0.032	0.022	0.001	0.027
21 Industrial inorganic chemicals	0.029	0.002	0.040	0.026	0.001	0.034
22 Petrochemical basic products	0.000	0.000	0.019	0.000	0.000	0.017
23 Organic chemical products (except Petrochemical basic products)	0.065	0.003	0.015	0.059	0.002	0.012
24 Synthetic resins	0.010	0.000	0.043	0.009	0.000	0.037
25 Synthetic fibers	0.000	0.000	0.058	0.000	0.000	0.050
26 Medicaments	0.020	0.001	0.054	0.018	0.000	0.046
27 Final chemical products, n.e.c.	0.036	0.001	0.053	0.031	0.001	0.046
28 Petroleum refinery products	0.000	0.000	0.006	0.000	0.000	0.006
29 Coal products	0.008	0.062	0.013	0.007	0.052	0.011
30 Plastic products	0.019	0.001	0.094	0.015	0.000	0.080
31 Rubber products	0.008	0.088	0.035	0.007	0.067	0.026
32 Leather, fur skins and miscellaneous leather products	0.004	0.001	0.143	0.003	0.000	0.086
33 Glass and glass products	0.058	0.003	0.045	0.050	0.002	0.039
34 Cement and cement products	0.094	0.033	0.011	0.080	0.028	0.009
35 Pottery, china and earthenware	0.018	0.001	0.097	0.016	0.001	0.072
36 Other ceramic, stone and clay products	0.050	0.014	0.053	0.043	0.011	0.043

Supplementary Table 1 (*Continued*)

Per 1 million yen of regional final demand in the Kumamoto urban area	No. of employed persons at work			No. of employees (excl. paid executives)		
	Kumamoto urban area	Other areas of Kumamoto	Other areas of Japan	Kumamoto urban area	Other areas of Kumamoto	Other areas of Japan
37 Pig iron and crude steel	0.000	0.000	0.048	0.000	0.000	0.042
38 Steel products	0.025	0.002	0.039	0.021	0.001	0.034
39 Cast and forged steel products	0.008	0.001	0.073	0.007	0.000	0.062
40 Other iron or steel products	0.028	0.001	0.058	0.023	0.001	0.050
41 Non-ferrous metals	0.006	0.000	0.033	0.005	0.000	0.028
42 Non-ferrous metal products	0.025	0.001	0.042	0.022	0.000	0.036
43 Metal products for construction and architecture	0.069	0.002	0.044	0.059	0.001	0.036
44 Other metal products	0.028	0.001	0.088	0.024	0.000	0.069
45 General industrial machinery	0.056	0.002	0.046	0.048	0.001	0.039
46 Special industrial machinery	0.067	0.003	0.019	0.059	0.002	0.016
47 Other general machines	0.038	0.002	0.061	0.031	0.001	0.050
48 Machinery for office and service industry	0.003	0.000	0.088	0.002	0.000	0.075
49 Electrical devices and parts	0.033	0.002	0.078	0.029	0.001	0.067
50 Applied electronic equipment and electric measuring instruments	0.022	0.013	0.063	0.019	0.012	0.056
51 Other electrical equipment	0.023	0.017	0.056	0.019	0.015	0.047
52 Household electric appliances	0.003	0.000	0.080	0.003	0.000	0.069
53 Household electronics equipment	0.001	0.000	0.081	0.001	0.000	0.071
54 Electronic computing equipment and accessory equipment of electronic computing equipment	0.005	0.023	0.004	0.004	0.021	0.004
55 Semiconductor devices and integrated circuits	0.049	0.029	0.025	0.045	0.026	0.022
56 Other electronic components	0.100	0.005	0.015	0.090	0.004	0.012
57 Passenger motor cars	0.000	0.000	0.092	0.000	0.000	0.081
58 Other cars	0.065	0.004	0.043	0.059	0.003	0.037
59 Motor vehicle parts and accessories	0.037	0.003	0.065	0.033	0.002	0.057
60 Ships and repair of ships	0.011	0.001	0.073	0.010	0.001	0.062
61 Other transportation equipment and repair of transportation equipment	0.001	0.000	0.078	0.001	0.000	0.069
62 Precision instruments	0.026	0.002	0.077	0.023	0.001	0.066
63 Miscellaneous manufacturing products	0.020	0.001	0.075	0.015	0.001	0.050
64 Reuse and recycling	0.101	0.003	0.008	0.085	0.003	0.007
65 Building construction	0.164	0.007	0.018	0.115	0.003	0.015
66 Repair of construction	0.163	0.004	0.021	0.115	0.003	0.017
67 Public construction	0.148	0.024	0.016	0.104	0.017	0.013
68 Other civil engineering and construction	0.160	0.005	0.016	0.113	0.004	0.013
69 Electricity	0.003	0.018	0.021	0.003	0.016	0.018
70 Gas and heat supply	0.013	0.000	0.033	0.011	0.000	0.028

Supplementary Table 1 (*Continued*)

	*Per 1 million yen of regional final demand in the Kumamoto urban area	No. of employed persons at work			No. of employees (excl. paid executives)		
		Kumamoto urban area	Other areas of Kumamoto	Other areas of Japan	Kumamoto urban area	Other areas of Kumamoto	Other areas of Japan
71	Water supply	0.104	0.007	0.014	0.089	0.006	0.012
72	Waste management service	0.075	0.022	0.011	0.065	0.019	0.009
73	Commerce	0.229	0.001	0.007	0.178	0.001	0.006
74	Finance and insurance	0.071	0.001	0.007	0.060	0.000	0.006
75	Real estate agencies and rental services	0.021	0.001	0.003	0.013	0.000	0.002
76	House rent	0.034	0.001	0.004	0.022	0.000	0.003
77	House rent (imputed house rent)	0.019	0.003	0.002	0.012	0.002	0.001
78	Railway transport	0.053	0.001	0.030	0.046	0.001	0.027
79	Road transport (except transport by private cars)	0.090	0.001	0.010	0.077	0.001	0.009
80	Self-transport by private cars	0.150	0.006	0.016	0.123	0.005	0.013
81	Water transport	0.031	0.032	0.024	0.026	0.028	0.021
82	Air transport	0.093	0.001	0.024	0.080	0.001	0.020
83	Freight forwarding	0.040	0.000	0.076	0.034	0.000	0.068
84	Storage facility service	0.072	0.002	0.029	0.061	0.001	0.025
85	Services relating to transport	0.075	0.002	0.022	0.063	0.001	0.018
86	Communication	0.074	0.001	0.008	0.065	0.001	0.006
87	Broadcasting	0.090	0.001	0.018	0.077	0.001	0.015
88	Information services	0.047	0.001	0.050	0.040	0.000	0.042
89	Internet based services	0.091	0.001	0.020	0.078	0.001	0.016
90	Image information, character information production and distribution	0.045	0.001	0.053	0.038	0.001	0.044
91	Public administration	0.084	0.001	0.007	0.080	0.001	0.005
92	Education	0.097	0.001	0.006	0.091	0.001	0.005
93	Research	0.113	0.002	0.013	0.105	0.001	0.010
94	Medical service and health	0.163	0.002	0.018	0.146	0.001	0.015
95	Social security	0.118	0.006	0.027	0.107	0.005	0.023
96	Nursing care	0.148	0.004	0.012	0.130	0.002	0.006
97	Other public services	0.135	0.034	0.017	0.093	0.024	0.013
98	Advertising services	0.113	0.001	0.044	0.087	0.000	0.036
99	Goods rental and leasing services	0.096	0.001	0.030	0.072	0.001	0.025
100	Repair of motor vehicles and machine	0.166	0.006	0.025	0.127	0.004	0.021
101	Other business services	0.124	0.001	0.036	0.093	0.000	0.029
102	Amusement and recreational services	0.161	0.002	0.022	0.126	0.002	0.018
103	Eating and drinking places	0.161	0.011	0.081	0.119	0.005	0.051
104	Accommodations	0.130	0.007	0.055	0.097	0.003	0.038
105	Cleaning, barber shops, beauty shops and public baths	0.179	0.001	0.007	0.140	0.001	0.006
106	Other personal services	0.184	0.009	0.010	0.143	0.007	0.007
107	Office supplies	0.070	0.006	0.057	0.055	0.004	0.045
108	Activities not elsewhere classified	0.136	0.034	0.049	0.087	0.011	0.033

Supplementary Table 2. Amount of Induced Employment per Unit of Regional Final Demand in the Areas of Kumamoto Other Than the Kumamoto Urban Area, by Sector

(Unit: person/million yen [valued at 2005 producer prices])

	*Per 1 million yen of regional final demand in the other areas of Kumamoto	No. of employed persons at work			No. of employees (excl. paid executives)		
		Kumamoto urban area	Other areas of Kumamoto	Other areas of Japan	Kumamoto urban area	Other areas of Kumamoto	Other areas of Japan
1	Crop cultivation	0.005	0.260	0.138	0.004	0.039	0.020
2	Livestock	0.009	0.426	0.071	0.006	0.066	0.022
3	Agricultural services	0.005	0.333	0.017	0.004	0.052	0.011
4	Forestry	0.003	0.318	0.005	0.002	0.044	0.004
5	Fisheries	0.011	0.295	0.024	0.007	0.045	0.013
6	Metallic ores	0.000	0.000	0.000	0.000	0.000	0.000
7	Non-metallic ores	0.007	0.093	0.016	0.006	0.077	0.013
8	Coal mining , crude petroleum and natural gas	0.000	0.000	0.012	0.000	0.000	0.011
9	Foods	0.068	0.030	0.135	0.034	0.008	0.059
10	Beverage	0.010	0.071	0.027	0.007	0.055	0.017
11	Feeds and organic fertilizer, n.e.c.	0.014	0.074	0.146	0.008	0.034	0.047
12	Tobacco	0.001	0.038	0.007	0.000	0.025	0.002
13	Textile products	0.003	0.066	0.109	0.002	0.051	0.074
14	Wearing apparel and other textile products	0.010	0.216	0.036	0.007	0.173	0.026
15	Timber and wooden products	0.004	0.141	0.006	0.003	0.049	0.005
16	Furniture and fixtures	0.002	0.018	0.117	0.002	0.012	0.087
17	Pulp, paper, paperboard, building paper	0.010	0.067	0.034	0.008	0.047	0.028
18	Paper products	0.006	0.080	0.020	0.005	0.058	0.017
19	Printing, plate making and book binding	0.007	0.073	0.031	0.006	0.059	0.026
20	Chemical fertilizer	0.006	0.027	0.026	0.005	0.025	0.022
21	Industrial inorganic chemicals	0.003	0.016	0.048	0.003	0.014	0.042
22	Petrochemical basic products	0.000	0.000	0.019	0.000	0.000	0.017
23	Organic chemical products (except Petrochemical basic products)	0.018	0.023	0.029	0.016	0.021	0.024
24	Synthetic resins	0.000	0.001	0.047	0.000	0.001	0.041
25	Synthetic fibers	0.000	0.000	0.058	0.000	0.000	0.050
26	Medicaments	0.003	0.016	0.054	0.003	0.015	0.046
27	Final chemical products, n.e.c.	0.001	0.001	0.071	0.001	0.001	0.061
28	Petroleum refinery products	0.000	0.001	0.007	0.000	0.000	0.006
29	Coal products	0.009	0.063	0.013	0.007	0.054	0.010
30	Plastic products	0.004	0.020	0.090	0.003	0.017	0.077
31	Rubber products	0.008	0.088	0.035	0.007	0.067	0.026
32	Leather, fur skins and miscellaneous leather products	0.004	0.018	0.126	0.003	0.013	0.076
33	Glass and glass products	0.004	0.033	0.060	0.004	0.028	0.052
34	Cement and cement products	0.009	0.116	0.014	0.007	0.099	0.011
35	Pottery, china and earthenware	0.006	0.059	0.054	0.005	0.050	0.041

Supplementary Table 2 (*Continued*)

*Per 1 million yen of regional final demand in the other areas of Kumamoto	No. of employed persons at work			No. of employees (excl. paid executives)		
	Kumamoto urban area	Other areas of Kumamoto	Other areas of Japan	Kumamoto urban area	Other areas of Kumamoto	Other areas of Japan
36	Other ceramic, stone and clay products	0.016	0.100	0.019	0.014	0.085	0.015
37	Pig iron and crude steel	0.000	0.000	0.048	0.000	0.000	0.042
38	Steel products	0.000	0.003	0.050	0.000	0.003	0.044
39	Cast and forged steel products	0.001	0.002	0.078	0.001	0.002	0.067
40	Other iron or steel products	0.001	0.002	0.079	0.001	0.002	0.068
41	Non-ferrous metals	0.006	0.017	0.029	0.005	0.015	0.025
42	Non-ferrous metal products	0.004	0.016	0.047	0.003	0.014	0.040
43	Metal products for construction and architecture	0.006	0.053	0.053	0.005	0.046	0.044
44	Other metal products	0.001	0.016	0.101	0.001	0.014	0.079
45	General industrial machinery	0.002	0.010	0.083	0.002	0.009	0.071
46	Special industrial machinery	0.024	0.012	0.046	0.021	0.011	0.039
47	Other general machines	0.002	0.006	0.098	0.001	0.005	0.081
48	Machinery for office and service industry	0.001	0.001	0.089	0.000	0.000	0.077
49	Electrical devices and parts	0.012	0.044	0.063	0.011	0.038	0.053
50	Applied electronic equipment and electric measuring instruments	0.021	0.074	0.021	0.019	0.065	0.017
51	Other electrical equipment	0.017	0.069	0.022	0.014	0.059	0.018
52	Household electric appliances	0.003	0.012	0.072	0.003	0.010	0.062
53	Household electronics equipment	0.006	0.041	0.045	0.005	0.039	0.040
54	Electronic computing equipment and accessory equipment of electronic computing equipment	0.005	0.023	0.004	0.004	0.021	0.004
55	Semiconductor devices and integrated circuits	0.050	0.034	0.021	0.045	0.031	0.018
56	Other electronic components	0.027	0.060	0.029	0.024	0.055	0.025
57	Passenger motor cars	0.000	0.000	0.092	0.000	0.000	0.081
58	Other cars	0.011	0.041	0.056	0.010	0.037	0.049
59	Motor vehicle parts and accessories	0.003	0.010	0.087	0.002	0.009	0.076
60	Ships and repair of ships	0.002	0.009	0.074	0.001	0.008	0.062
61	Other transportation equipment and repair of transportation equipment	0.000	0.000	0.081	0.000	0.000	0.071
62	Precision instruments	0.000	0.000	0.097	0.000	0.000	0.083
63	Miscellaneous manufacturing products	0.005	0.037	0.054	0.004	0.028	0.037
64	Reuse and recycling	0.075	0.029	0.009	0.063	0.024	0.007
65	Building construction	0.060	0.107	0.024	0.042	0.072	0.019
66	Repair of construction	0.009	0.154	0.026	0.007	0.107	0.021
67	Public construction	0.007	0.159	0.023	0.005	0.111	0.019
68	Other civil engineering and construction	0.032	0.129	0.020	0.023	0.090	0.017
69	Electricity	0.005	0.026	0.010	0.004	0.023	0.008
70	Gas and heat supply	0.001	0.005	0.043	0.001	0.005	0.037

Supplementary Table 2 (*Continued*)

*Per 1 million yen of regional final demand in the other areas of Kumamoto	No. of employed persons at work			No. of employees (excl. paid executives)		
	Kumamoto urban area	Other areas of Kumamoto	Other areas of Japan	Kumamoto urban area	Other areas of Kumamoto	Other areas of Japan
71 Water supply	0.005	0.101	0.020	0.004	0.086	0.017
72 Waste management service	0.006	0.091	0.010	0.005	0.079	0.008
73 Commerce	0.082	0.145	0.011	0.064	0.112	0.009
74 Finance and insurance	0.009	0.039	0.029	0.008	0.033	0.025
75 Real estate agencies and rental services	0.003	0.013	0.013	0.002	0.007	0.010
76 House rent	0.010	0.020	0.009	0.007	0.012	0.007
77 House rent (imputed house rent)	0.001	0.019	0.003	0.001	0.011	0.003
78 Railway transport	0.001	0.020	0.050	0.001	0.017	0.045
79 Road transport (except transport by private cars)	0.004	0.084	0.014	0.003	0.072	0.012
80 Self-transport by private cars	0.013	0.137	0.021	0.010	0.112	0.018
81 Water transport	0.005	0.083	0.014	0.004	0.072	0.011
82 Air transport	0.001	0.044	0.049	0.001	0.038	0.042
83 Freight forwarding	0.001	0.023	0.096	0.001	0.020	0.086
84 Storage facility service	0.004	0.067	0.031	0.003	0.057	0.027
85 Services relating to transport	0.002	0.065	0.031	0.002	0.055	0.025
86 Communication	0.055	0.017	0.010	0.048	0.015	0.008
87 Broadcasting	0.072	0.017	0.021	0.062	0.014	0.017
88 Information services	0.000	0.002	0.101	0.000	0.002	0.086
89 Internet based services	0.006	0.026	0.084	0.005	0.023	0.065
90 Image information, character information production and distribution	0.001	0.013	0.079	0.001	0.011	0.065
91 Public administration	0.047	0.037	0.008	0.045	0.036	0.007
92 Education	0.046	0.043	0.016	0.043	0.041	0.014
93 Research	0.085	0.014	0.025	0.078	0.013	0.022
94 Medical service and health	0.051	0.111	0.022	0.044	0.100	0.018
95 Social security	0.003	0.134	0.007	0.002	0.121	0.005
96 Nursing care	0.011	0.139	0.013	0.009	0.122	0.008
97 Other public services	0.008	0.155	0.025	0.006	0.105	0.020
98 Advertising services	0.001	0.005	0.086	0.001	0.004	0.070
99 Goods rental and leasing services	0.002	0.079	0.038	0.002	0.059	0.032
100 Repair of motor vehicles and machine	0.012	0.150	0.033	0.010	0.113	0.028
101 Other business services	0.001	0.064	0.110	0.001	0.048	0.090
102 Amusement and recreational services	0.004	0.160	0.023	0.003	0.125	0.019
103 Eating and drinking places	0.016	0.163	0.072	0.010	0.118	0.046
104 Accommodations	0.009	0.136	0.050	0.006	0.100	0.034
105 Cleaning, barber shops, beauty shops and public baths	0.003	0.172	0.012	0.003	0.134	0.009
106 Other personal services	0.005	0.184	0.013	0.004	0.142	0.010
107 Office supplies	0.049	0.036	0.047	0.038	0.027	0.037
108 Activities not elsewhere classified	0.092	0.073	0.054	0.060	0.034	0.037

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International Workshop

The Japan Institute for Labour Policy and Training (JILPT), the Chinese Academy of Labour and Social Security (CALSS), and the Korea Labor Institute (KLI) held a research forum on the theme "Factors Involved in the Governance of Labor-Management Relations" on December 4, 2012 in Chengdu, China. The three institutes hold a forum once every year with a common theme and present their research results with the aim of promoting mutual understanding among the three countries and raising the standards of research. This was the tenth forum held with the collaboration of the three research institutes. Japanese text of the research papers presented at the forum can be accessed from the JILPT website (http://www.jil.go.jp/institute/kokusai/index.htm).

JILPT

Keiichiro Hamaguchi, Models of Collective Labor-Management Relations, as Compared to Individual Labor-Management Relations

Oh Hak-Soo, The Current Status and Raison d'Etre of General Unions: In Relation to the Resolution of Individual Labor Disputes

CALSS

Zhang Yiming, Initiatives Carried out in China in the Settlement of Labor-Management Disputes

Wang Wenzhen, Legal Systems for the Fundamental Resolution of Issues in Chinese Labor Relations

KLI

Lee Sung-Hee, The Implementation Status of South Korea's Labor-Management Dispute Resolution Systems and Challenges to Their Improvement

Song Min-Soo, Characteristics of Labor Dispute Mediators

Research Reports

The findings of research activities undertaken by JILPT are compiled into Research Reports in Japanese. Below is a list of the reports published from April 2012 onward. The complete Japanese text of these reports can be accessed from the JILPT website (http://www.jil.go.jp/institute/pamphlet/). We are currently working on uploading abstracts of reports in English onto the JILPT website as well (http://www.jil.go.jp/english/reports/jilpt_01.html).

Research Reports

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