

Japan Labor Review

Volume 9, Number 4, Autumn 2012

Special Edition

The Great East Japan Earthquake, the Labor Market, and Policy Reactions

Articles

The Impact of the Great East Japan Earthquake on the Labor Market—Need to Resolve the Employment Mismatch in the Disaster-Stricken Areas

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Trends in Electricity Conservation Measures: Focusing on Responses by Industry Groups and Companies

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Article Based on Research Report

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JILPT Research Activities



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NEXT ISSUE (Winter 2013)

The winter 2013 issue of the Review will be a special edition devoted to **Has the Japanese Employment System Changed?**

Introduction

The Great East Japan Earthquake, the Labor Market, and Policy Reactions

The frequency of natural disasters is said to be increasing worldwide because of global warming. Although natural disasters cannot be prevented, the damage they cause can be mitigated through improvements in building structures, infrastructure, and social institutions, such as social insurance. The Great East Japan earthquake on March 11, 2011 killed about 20,000 people and damaged properties equivalent to 4% of Japan's gross domestic product (GDP). Articles in this special issue provide an overview of the short- and medium- term labor-market consequences of the earthquake and government labor-market policies. Each article provides generalizable knowledge on the labor market's reaction that will be helpful for designing policies to reduce future damage from natural disasters.

Higuchi, Inui, Hosoi, Takabe and Kawakami draw on several government statistics to describe the industry/occupation structure of the damaged area, population outflow from the area, and the number of unemployment insurance recipients. Administrative records from a typical local employment office, Ishinomaki office, indicate a severe mismatch between job offers and job applicants in terms of industry: There were excess job offers for construction and civil engineering sectors and excess job applicants for the food processing industry, which had been the predominant industry in the area before the disaster.

Nishimura reports on how firms responded in terms of human resource management to the supply shortage of electricity induced by the failure of the Fukushima Daiichi Nuclear Power Plant and other thermal power plants of the Tokyo Electric Power Company (TEPCO). He introduces several cases indicating how business associations reduced the peak electricity usage by rotating operation days or by sharing knowledge about electricity conservation. While taking these measures was costly, in some cases, the shortage of electricity worked as a "shock therapy" that enhanced production efficiency.

Ohtake, Okuyama, Sasaki and Yasui analyze post-earthquake labor-market flows after the Hanshin-Awaji Earthquake in 1995, using data from local employment offices of the afflicted region. The numbers of both job vacancies and job seekers increased for full-time workers after the earthquake, but the number of placements decreased because of mismatches between jobs and applicants. In the case of part-time employment, the number of job vacancies increased, while the number of job seekers and placements decreased.

Shu surveys existing literature to derive implications for the population and employment recovery from the damage of the Great East Japan Earthquake. Drawing upon the consensus that damage caused by a natural disaster tends to have little long-run impact in growing cities, but it tends to accelerate the speed of contraction in declining cities, Shu predicts different recovery paths for three affected prefectures.

Genda was involved in designing a post-disaster labor-market policy package, named *Japan As One*, as a committee member of the study group for the Reconstruction Design Council in

Response to the Great East Japan Earthquake. He briefly introduces his policy recommendations in the study group, which mostly materialized as a part of a policy package. Looking back his experience, he emphasizes the importance of preparing a scheme for financing the surge in expenditures for employment adjustment subsidies and employment insurance in emergency situations. The current financing scheme based on employment insurance accounts is not resilient to devastating shocks, such as the 2008 Financial Crisis or the Great East Japan Earthquake. He then introduces and assesses such policies as unemployment insurance, newly embarking job-seeker support, public assistance, and local government's job creation. In particular, he proposes fine tuning job-seeker support in some detail. Finally, referring to the fact that only a tiny fraction of firms creates the majority of jobs, he hints at finer policy targeting of small- and medium-sized enterprise subsidies to selected firms.

Nogawa summarizes government labor-market-policy measures to prevent labor-market turmoil after the earthquake. Nogawa favorably assesses the effectiveness of conventional policy measures, such as unemployment insurance and employment-adjustment subsidies, but he criticizes the performance of newly implemented policies that aim to create jobs in afflicted areas. He proposes the expansion of training programs that help workers in affected industries or areas to find jobs in industries or areas that are expanding.

Taking stock of the results from each paper, the damage caused by natural disasters tends to accelerate transformation of the labor-market structure because some damaged establishments in declining industries or regions do not come back. This can well be a reason why the industry/regional mismatch between job vacancies and applications becomes serious in the recovery process. Therefore, both policies that slow the speed of industrial composition in the afflicted region and those that mobilize afflicted workers from declining to growing industries/regions contribute to mitigating victims' hardship after a natural disaster.

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The Impact of the Great East Japan Earthquake on the Labor Market — Need to Resolve the Employment Mismatch in the Disaster-Stricken Areas

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This paper analyzes the impact of the Great East Japan Earthquake on population movements and employment situation, mainly in the three disaster-stricken prefectures (Iwate, Miyagi and Fukushima Prefectures). As for population movements, emigration from the disaster-stricken areas has increased since the earthquake. In Fukushima Prefecture in particular, the number of young emigrants rose rapidly due to the impact of the accident at Fukushima Daiichi Nuclear Power Station. The employment situation, as measured by the status of job offers and applications, in the three disaster-stricken prefectures, appears on the surface to be improving, as the number of new job offers is growing as a result of an increase in offers related to post-earthquake reconstruction and a recovery in production in the manufacturing industry. However, in fact, the employment situation remains severe, with the number of applicants for employment insurance benefits growing by around 40% in the 10 months from the earthquake compared with the same period of the previous year. The earthquake has not had a significant impact on employment on a nationwide basis. However, in the three disaster-stricken prefectures, it has affected seriously through a mismatch between job offers and applicants. It is thus an urgent task to take measures to resolve the mismatch.

I. Past Studies on the Impact of Major Natural Disasters and Characteristics of the Industries in the Disaster-Stricken Areas

1. Previous Literature on the Economic Impact of Major Natural Disasters

When evaluating the damage caused by a major natural disaster, it is necessary to estimate the extent of not only direct damage, including human and physical damages, in the disaster-stricken areas but also indirect damage, such as the nationwide economic impact (impact on income, employment, industrial production, inflation, etc.). However, according to a survey conducted by Cavallo and Noy (2010) on the economic impact of natural disasters, while engineering studies to estimate direct damage (for instance, human damage, crop damage and damage on infrastructure, including buildings and structures) is well researched, little economic studies to estimate indirect damage have yet been done. Cavallo and Noy (2010) summarized that most of the studies cited in their survey indicated that natural disasters produce a negative impact on economic growth in the short term. Moreover, they

placed a greater emphasis on the need to consider through what channels natural disasters produce a negative impact on economic growth and whether such channels exist only temporarily or for a long period of time. The past research has not reached consensus on the extent of estimated long-term impact on economic growth. One methodological problem regarding the measurement of the impact is the difficulty of comparing the post-disaster growth rate with the hypothetical growth rate of what would happen if the disaster doesn't occur.

Even though the nationwide economic impact of a major natural disaster may be limited, the damage toward to the local economy of the disaster-stricken area is significant. The analysis of the labor market in New Orleans, which suffered extensive damage from Hurricane Katrina, provides a number of implications for us. Vigdor's (2008) labor market analysis in the period before and after the hurricane showed how local communities' post-disaster reconstruction process is affected by the economic characteristics they had before the disaster. In New Orleans, which had a population of more than 400,000 people, most residents were evacuated from the city immediately after the hurricane. Over the two-year period from the hurricane, only around half of the evacuees returned to their homes. From the analysis of the patterns of reconstruction in other cities after past natural disasters, great fires and wars, Vigdor (2008) concluded that cities that have few economic advantages are likely to experience an accelerated population outflow after a disaster while cities with strong economic advantages are likely to overcome the temporary outmigration caused by a disaster and see a recovery to and above the pre-disaster level in the long term. Vigdor pointed out that New Orleans falls under the category of cities with few economic advantages. He noted that the scarcity of employment opportunities due to a lack of major industries other than tourism-related businesses becomes an obstacle to encourage population inflow toward New Orleans. Meanwhile, an analysis by Groen and Polivka (2008) of the labor market for people evacuated from the areas devastated by Hurricane Katrina showed that although the evacuees remained in a disadvantageous position in the market during the 13-month period from the hurricane, the degree of their disadvantage declined as they adapted to their new economic situation. All the same, it was confirmed that evacuees who have been unable to return to their original residence location have faced a more disadvantageous position in the labor market than evacuees who have returned home.

The Great Hanshin-Awaji Earthquake, which hit the Hanshin-Awaji region in western Japan, is a typical case of an earthquake occurring directly under a densely-populated urban area. Nagamatsu (2006) was a prominent research concerning the process of economic reconstruction after the Great Hanshin-Awaji Earthquake. He conducted a survey and pointed out that while the effective ratio of new job offers to applicants steadily recovered after the earthquake, there was a mismatch between job offers and applicants regarding the job type, age, and employment arrangement, etc.

Our research objective is to analyze the process of reconstruction in the areas devastated by the Great East Japan Earthquake in light of the past studies mentioned above, with

a particular focus on population movement and the employment situation. The rest of this paper is organized as follows: in this section below, we analyze the characteristics of the industries of the three disaster-stricken prefectures in the Tohoku region (Iwate, Miyagi and Fukushima Prefectures; hereinafter referred to as “the three disaster-stricken Tohoku prefectures”) and the status of reconstruction. In Section II, we analyze the population outflow from the three disaster-stricken Tohoku prefectures since the earthquake, and in Section III, we analyze the recovery in the employment situation in those prefectures and across Japan. In Section IV, we provide our conclusion.

2. Characteristics of the Industries of the Three Disaster-Stricken Tohoku Prefectures

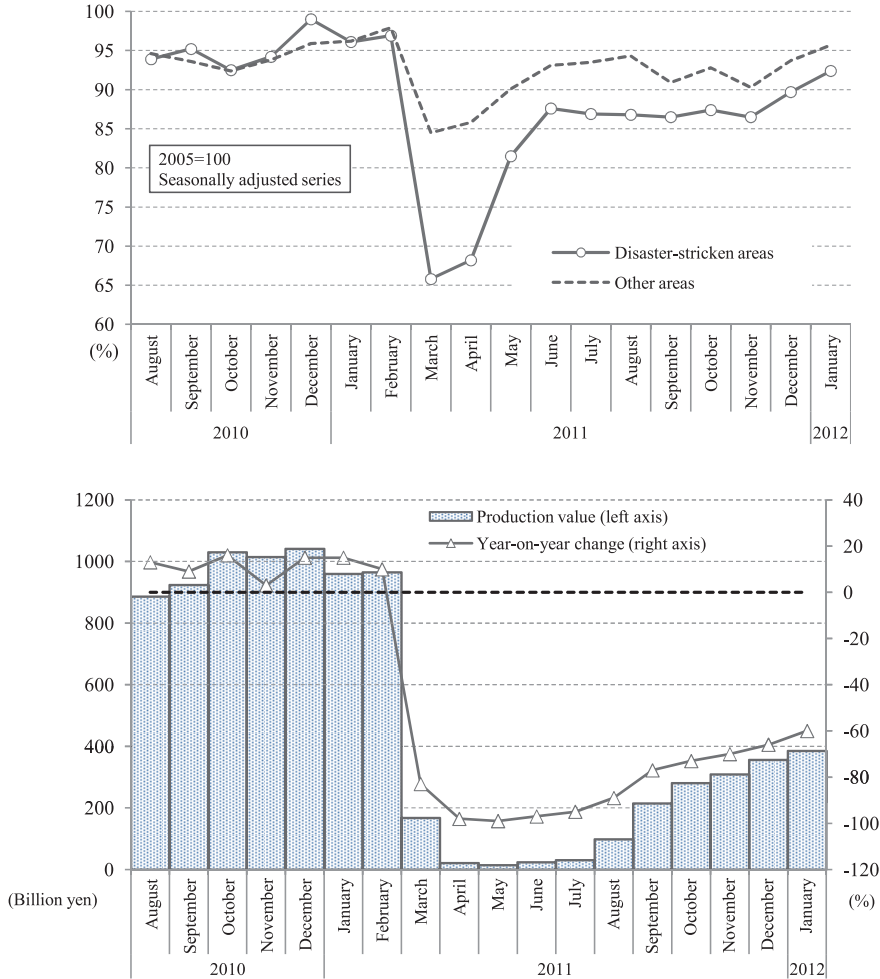
According to the 2010 Population Census, industries that accounted for more than 10% of the overall employees in the three disaster-stricken Tohoku prefectures were “wholesale/retail industries”(16.8%), “manufacturing industry” (16.2%) and “medical and welfare services” (10.4%). Meanwhile, when we look at the breakdown of employees by subdivision of industry based on the 2011 Economic Census, we see that industries that accounted for relatively large shares of the overall entire workforce of employees in the three disaster-stricken Tohoku prefectures were “food production industry” (2.7%), “electronics parts, devices and circuits manufacturing industry” (1.7%) and “transport machinery and equipment manufacturing industry” (0.9%). The “fishery food production industry,” which employed 0.8% of the overall workforce, accounted for around 30% of the employees working in the food production industry, so the food production industry is presumed to have suffered significant damage from the tsunami in the coastal area. According to Figure 1, which shows monthly changes in the Industrial Production Index (hereafter, IPI) on a nationwide basis and in the disaster-stricken area, the Index dropped steeply both on a nationwide basis and in the disaster-stricken area in March and April, immediately after the earthquake, before rebounding in May. However, the IPI for the disaster-stricken areas has stayed around 7 to 8 percentage points lower than the pre-earthquake level. The level of year-on-year growth in the production value in the tsunami-flooded areas, as shown in Figure 1, dropped steeply immediately after the earthquake and has remained low since then. The earthquake and tsunami dealt serious damage to the fishery product processing industry, which was the mainstay industry of the three disaster-stricken Tohoku prefectures, with long-lasting effects.

II. The Earthquake’s Impact on Population Movements

1. Changes in Net Migration in the Three Disaster-Stricken Tohoku Prefectures

In this section, we look at the status of net migration in the three disaster-stricken Tohoku prefectures as shown in the Annual Report on the Internal Migration in Japan

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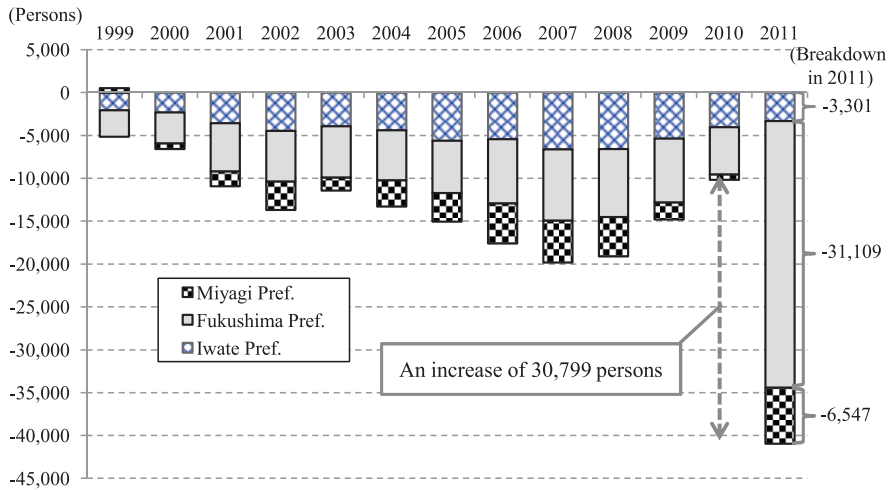


Sources: Ministry of Economy, Trade and Industry, *Industrial Production Index for Disaster-Stricken Areas and Other Areas* (estimate) and *Estimated Production Value (on a year-on-year basis) of Industrial Facilities Located in Tsunami-Flooded Areas (59 facilities)* (estimate).

Figure 1. Changes in the Estimated Industrial Production Index in the Disaster-Stricken Areas

derived from the Basic Resident Registers. This report is compiled on the basis of data on immigrants submitted to municipal governments. Therefore, it should be kept in mind that people who left the disaster-stricken areas are counted as emigrants only if they submitted an immigration application to the municipality where their new residence is located.¹ Figure 2

¹ As for the number of people evacuated from each of the three disaster-stricken Tohoku prefectures as of December 15, 2011, the number stood at 59,993 for Fukushima Prefecture, at 8,597 for

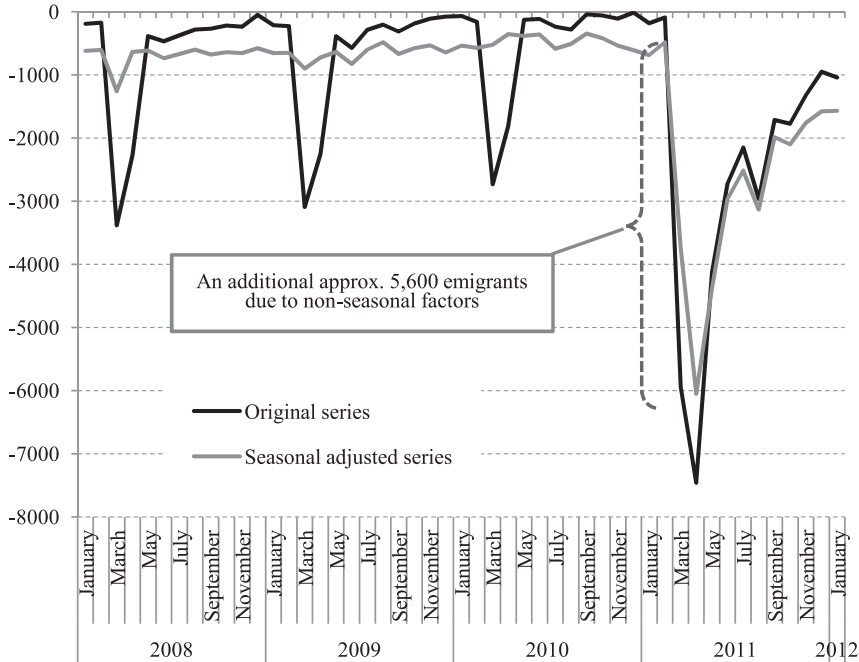


Source: Ministry of Internal Affairs and Communications, *Annual Report on the Internal Migration in Japan Derived From the Basic Resident Registers* (from 1999 to 2011 [from March to December]).

Figure 2. Net Emigration in the Three Disaster-Stricken Tohoku Prefectures (From 1999 to 2011 [Total in the March-December Period])

provides a comparison between the total net migration (negative figures indicate net emigration) in the three disaster-stricken Tohoku prefectures in the post-earthquake period of March through December 2011 and in each year between 1999 and 2010. It shows that net emigration from the three disaster-stricken Tohoku prefectures increased by 30,799 people in 2011 compared with 2010. In particular, net emigration from Fukushima in 2011 came to 31,109 people (it is equivalent to 1.5 percent of total Fukushima population), accounting for around 80% of the total net emigration from the three disaster-stricken Tohoku prefectures. The steep rise in net emigration from Fukushima Prefecture is considered to reflect the impact of the accident at the Fukushima Daiichi Nuclear Power Station as well as the earthquake impact. In Fukushima Prefecture, emigration increased in all age groups in the March-December period of 2011 compared with the same period of the previous year. Emigration in age groups younger than 44 years old recorded a particularly sharp increase (an increase of 8,799 in the 0-14 age group, of 2,237 in the 15-24 age group, 6,102 in the 25-34 age group and 4,524 in the 35-44 age group). The increase of nearly 9,000 in emigration in the 0-14 age group presumably indicates that many parents with young children moved out of Fukushima Prefecture due to concerns over the impact of the accident at the Fukushima

Miyagi Prefecture and at 1,545 for Iwate Prefecture. These figures are roughly double the net emigration numbers in the period from March to December 2011. According to the most up-to-date data (as of February 23), the number of evacuees stood at 62,674 for Fukushima Prefecture, at 8,548 for Miyagi Prefecture and at 1,566 for Iwate Prefecture (data compiled by the Reconstruction Agency).



Source: Calculated based on the *Annual Report on the Internal Migration in Japan Derived from the Basic Resident Registers* by the Ministry of Internal Affairs and Communications (from January 1999 to January 2012).

Figure 3. Seasonally Adjusted Net Emigration from Fukushima Prefecture

Daiichi Nuclear Power Station. The decline in the population of younger people due to the post-disaster evacuation is expected to aggravate such problems as the declining birthrate, aging of society and a labor shortage in the disaster-stricken areas in the near future.

2. Net Emigration from the Three Disaster-Stricken Tohoku Prefectures by Gender and Age

Net emigration from the Tohoku region fluctuates by season (usually increases in March and April in every year). However, in Fukushima Prefecture, net emigration after the earthquake became much larger in 2011 than usual. In order to distinguish the earthquake effect from seasonal effect on emigration, we employed X-12 ARIMA seasonal adjustment method. We used the monthly emigration data regarding Fukushima Prefecture in the period from January 1999 to January 2012 for this seasonal adjustment estimation. Then we can detect outlier value, which is considered to indicate the earthquake effect. Figure 3, which summarizes the analysis results, shows that there was a net emigration of around 5,600 people due to non-seasonal factors (i.e. the earthquake effect) between March and April 2011.

Our seasonally adjusted emigration data shows that net emigration has not yet returned to the pre-earthquake level although it is gradually returning toward that level.

III. Employment Situation in the Three Disaster-Stricken Tohoku Prefectures

1. Post-Earthquake Changes in the Employment Situation

(1) Changes in the Number of Job Offers, Applications, and Placements, etc. in the Three Disaster-Stricken Tohoku Prefectures

Regarding the employment situation in the three disaster-stricken Tohoku prefectures after the Great East Japan Earthquake, while the number of effective job offers exceeded about 100,000 for four consecutive months from September 2011, the number of effective job applicants reached over 140,000. In addition, the number of employment insurance benefits recipients is growing on a year-on-year basis. The employment situation in the disaster-stricken areas thus remains severe.

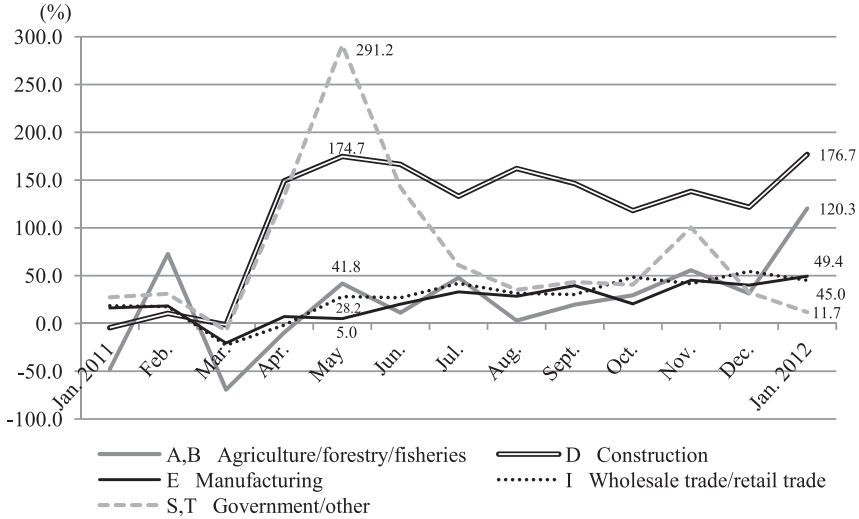
After the earthquake, the number of new job offers continued to rise in the three disaster-stricken Tohoku prefectures due to an increase in job offers related to post-earthquake reconstruction and a recovery in production in the manufacturing industry. In January 2012, the number stood at 45,752.

According to Figure 4, which shows year-on-year changes in the number of job offers by industry, offers in the “construction industry” rose particularly sharply, recording a year-on-year growth of 176.7% in January 2012. Job offers in the “public service, etc.” sector are also increasing due to the use of the job creation fund program from April through June. Job offers in the manufacturing industry have also gradually recovered since April 2011, posting a year-on-year increase of 49.4% in January 2012.

On the other hand, the number of new job applicants declined after peaking in April and has been stable since September. In January 2012, the number reached at 29,430. According to Figure 5, which shows year-on-year changes in the number of new applicants who left their previous jobs due to employer-side reasons between April 2011 and January 2012, the number of such applicants temporarily rose in Fukushima Prefecture in December, 2011. That is presumably because employers that had suspended business operation while avoiding job reduction until then eventually decided to dismiss employees. The number of job applicants declined moderately after peaking in those prefectures in June and has recently been stable on a month-to-month basis. In January 2012, the number declined on a year-on-year basis in all three disaster-stricken Tohoku prefectures. However, during the period, this year on year changes in the number of applicants in the area continued to be higher than that in a nationwide basis.

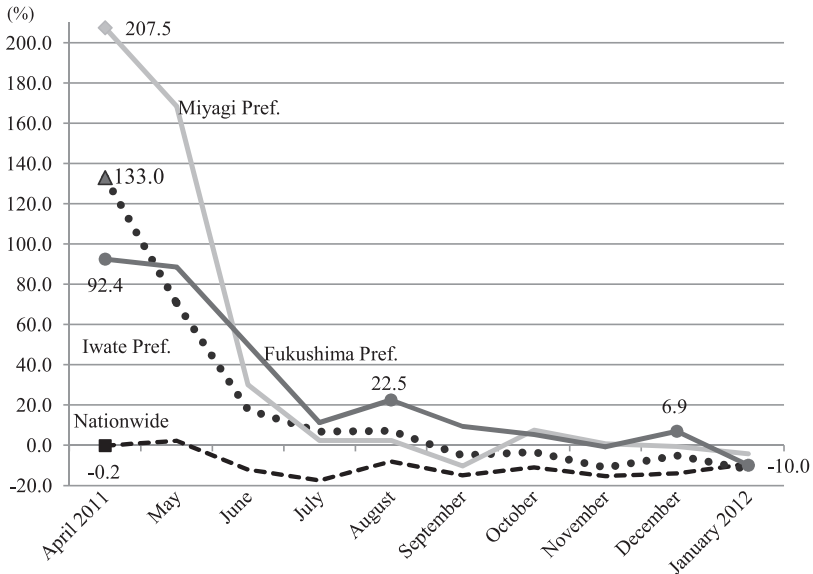
As described above, the employment environment in the three disaster-stricken Tohoku prefectures appears on the surface to be recovering. However, as an employment mismatch has arisen, mainly in the coastal regions, where the earthquake damage was

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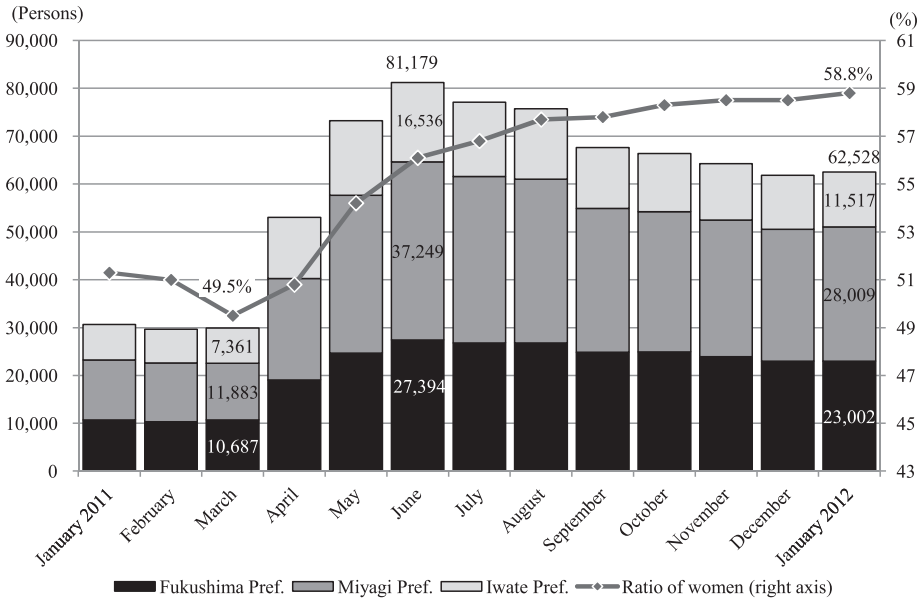
Source: Ministry of Health, Labour and Welfare, *Report on Employment Service* (January 2012).

Figure 4. Year-on-Year Changes in the Number of New Job Applicants by Industry in the Three Disaster-Stricken Tohoku Prefectures (Comparison of Raw Numbers for 2011 with Those for 2010)



Source: Ministry of Health, Labour and Welfare, *Report on Employment Service* (January 2012).

Figure 5. Year-on-Year Changes in the Number of New Applicants for Permanent Jobs Who Left Their Previous Jobs Due to Employer-Side Reasons (Comparison of Raw Numbers for 2011 with Those for 2010)



Source: Ministry of Health, Labour and Welfare, *Monthly Report on Employment Insurance Service*.

Figure 6. Changes in the Number of Employment Insurance Benefits Recipients in the Three Disaster-Stricken Tohoku Prefectures (Including Recipients for Whom an Extension of the Provision Period Has Been Granted for Various Reasons)

significant, the employment environment in the disaster-stricken areas remains severe.

(2) Changes in the Number of Employment Insurance Benefits Recipients in the Three Disaster-Stricken Tohoku Prefectures

While the effective ratio of job offers to applicants is on an uptrend, the number of applications for unemployment insurance benefits totaled around 230,000 (a year-on-year increase of 40%) in the 11-month period from March 12, 2011, to February 19, 2012. According to Figure 6, the number of employment insurance benefits recipients (including recipients for whom an extension of the provision period has been granted for various reasons) gradually declined since peaking at 81,179 people (a year-on-year increase of 101.9%) in June, it is equivalent to 5.4 percent of total number of insured works in Fukushima on February 28, 2011. In January 2012, the number reached at 65,528 people (a year-on-year increase of 103.8%).

Since April 2011, the ratio of women to all employment insurance benefits recipients has been rising, standing at 58.8% in January 2012, indicating that the employment situation for women is severe. In the coastal region, the fishery product processing industry, which

was employing a large number of women, including part-time workers, suffered significant damage, and many displaced workers there have been unable to find new jobs. As a result, the number of effective job applicants increased, making the employment situation for women severe. In the coastal region of Miyagi Prefecture, where the damage was significant, the number of permissions for employment insurance benefits rose 328.2% in the coverage area of the Ishinomaki Public Employment Security Office between March 12, 2011, the day after the earthquake, and January 22, 2012, compared with the same period of the previous year, and the number increased 571.7% in the coverage area of the Kesenuma Public Employment Security Office. Compared with the situation in inland regions, the employment situation in the coastal region remains particularly severe.

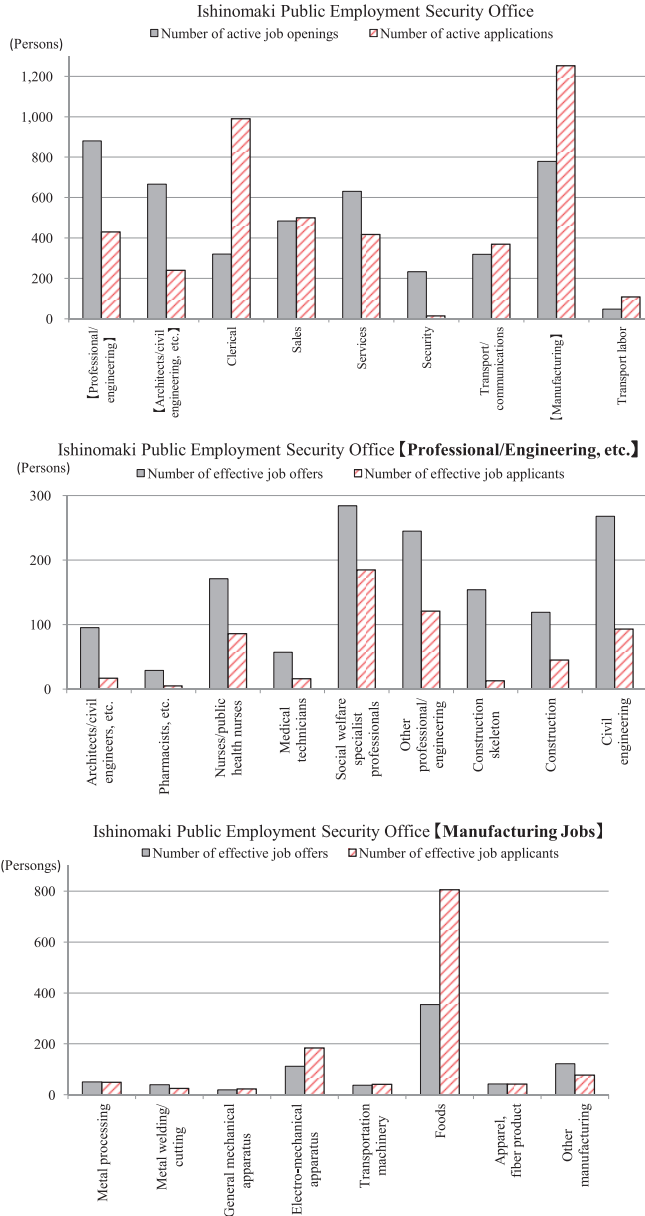
(3) Employment Mismatch

In the three disaster-stricken Tohoku prefectures, the effective ratio of job offers to applicants improved for eight consecutive months from May. However, a mismatch between job offers and applicants has arisen in the disaster-stricken areas. While there is a large number of job offers for people with qualifications and skills related to “professional and technical jobs” and “construction and civil engineering workers,” applicants with the matching qualifications and skills are in shortage. According to Figure 7, which shows the employment situation in the coverage area of the Ishinomaki Public Employment Security Office, there is a great demand for professional and technical workers regardless of types of occupations. Job offers in the manufacturing industry are not strong enough to accept all job applicants in the sector, with the scarcity of job offers in the food production industry accounting for most of the overall labor demand weakness in the sector. Given that the fisheries product processing industry was prosperous in the coastal region before the earthquake, this presumably indicates displaced workers’ strong desire to obtain the same jobs as the ones in which they were engaged before the disaster. In the disaster-stricken areas, it is important to shape the policy agenda in improving the employment situation while taking account of the characteristics of the local industries. We conduct further analysis regarding the employment mismatch in the next section.

2. Status of Job Offers and Applications by Job Type (Employment Mismatch)

In this section, based on the mismatch indicator used by Jackman and Roper (1987), we estimate the impact of the mismatch between job offers and applications that has affected unemployed people in the disaster-stricken areas. For the estimation, we use a prefecture-by-prefecture breakdown of the Report on Employment Service by the Ministry of Health, Labour and Welfare.² The mismatch indicator used by Jackman and Roper (1987) is

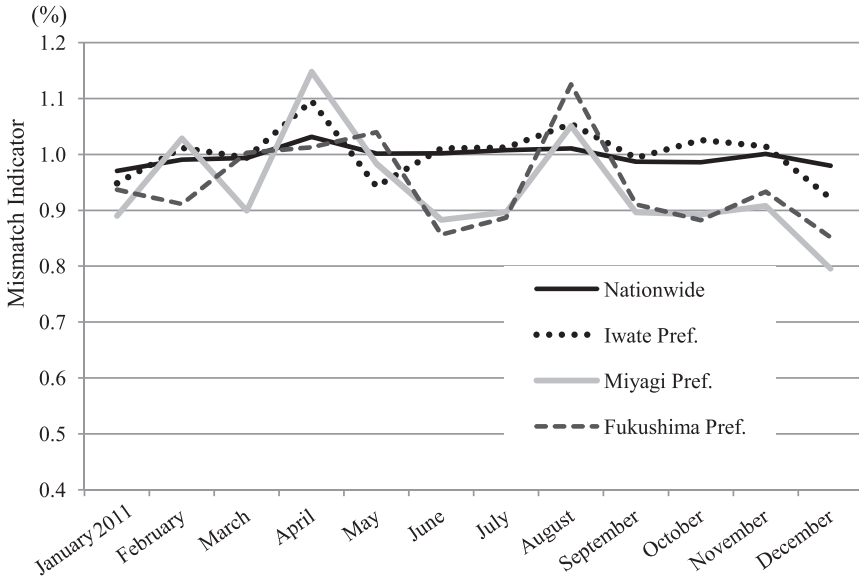
² The Report on Employment Service represents statistics compiled based on the results of job mediation activities conducted by the Public Employment Security Offices across Japan. It should be noted that according to the 2010 Survey on Employment Trends by the Ministry of Health, Labour



Source: Miyagi Labor Bureau, *Job Offers-Applicants Balance Sheet* (January 2012).

Figure 7. Numbers of Job Offers and Applicants in Miyagi Prefecture (January 2012)

and Welfare, people who obtained jobs through Public Employment Security Offices accounted for 21.5% of all people who obtained jobs (26.2% if people who obtained jobs through the internet service provided by the Public Employment Security Offices are included). It should also be noted that jobs covered by the analysis do not include the types of jobs that are not mediated by the Public Employment Security Offices, such as management jobs.



Source: Estimated by the authors based on prefecture-by-prefecture data of the *Report on Employment Service* by the Ministry of Health, Labour and Welfare. The mismatch indicator was calculated with regard to 65 types of job.

Note: The mismatch indicator is as defined by Formula (1).

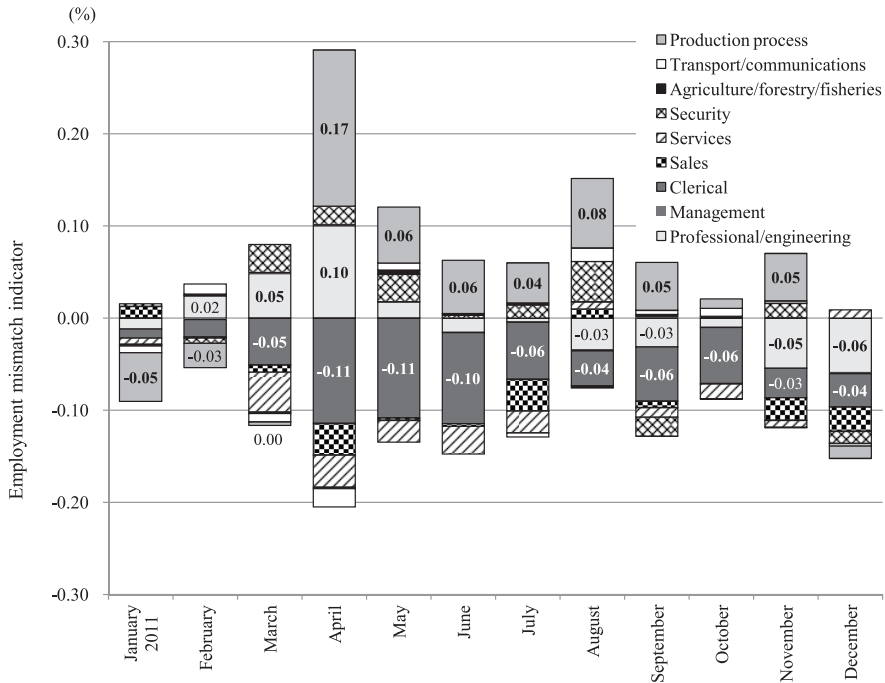
Figure 8. Changes in the Mismatch Indicator (Comparison between Nationwide, Iwate, Miyagi, and Fukushima Prefectures; Year-on-Year Growth Rate)

defined as the ratio of unemployed people who cannot obtain jobs due to an employment mismatch to all unemployed people. The estimation formula is as follows:

$$(1) \quad \frac{1}{U} * \frac{1}{2} \sum_{i=1}^n \left| U_i - \left(\frac{U}{V} \right) V_i \right| = \frac{1}{2} \sum_{i=1}^n \left| \frac{U_i}{U} - \frac{V_i}{V} \right|$$

“N” represents the number of jobs available. U_i stands for the number of job applicants and V_i stands for the number of job offers regarding job type i . U and V are arrived at through the formulas: $U = \sum_{i=1}^n U_i$ and $V = \sum_{i=1}^n V_i$. We computed the mismatch indicator as defined by Formula (1) on a prefecture-by-prefecture basis for each month between January 2010 and December 2011. Figure 8 shows the mismatch indicators on a national average basis and for the three disaster-stricken Tohoku prefectures.

To exclude the effects of seasonal factors, we calculated the growth rate of the mismatch indicator for each month of 2011 compared with the same month of the previous year (year-on-year). On a national average basis, the mismatch regarding the job type increased in April, the month after the earthquake, but in other months, the mismatch indicator did not



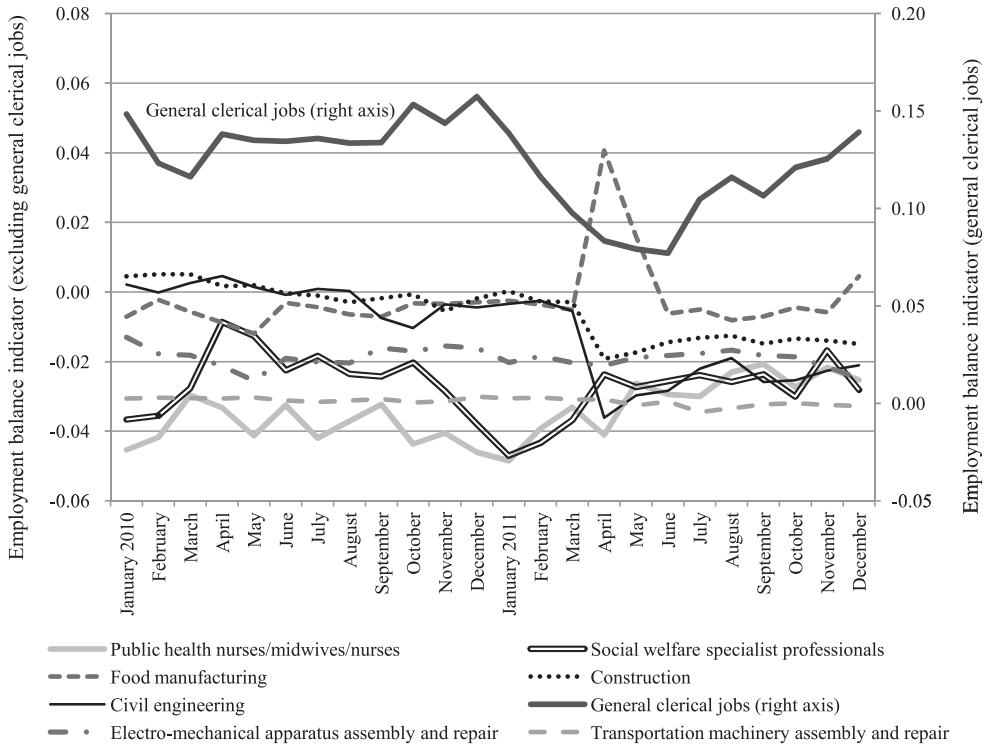
Note: The mismatch indicator indicates which of the job vacancy ratio and the unemployment rate is higher with regard to each job type, so the “ $U_i/U - V_i/V$ ” part of Formula (1) is calculated with regard to each job type. To remove the effects of seasonal factors, year-on-year changes are also indicated. The values (both positive and negative) larger than 0.03 are written in bold characters. Jobs which are difficult to classify were excluded.

Figure 9. Contributions by Job Type to the Year-on-Year Growth Rate of the Employment Mismatch Indicator

show significant fluctuations compared with the usual years. In the disaster-stricken areas, a mismatch arose in April but later declined. In August, a significant mismatch arose again. Since then, the mismatch has gradually been declining.

Which job types contributed to the significant mismatch in April and August? Figure 9 shows the contributions of nine job types to the year-on-year growth rate of the mismatch indicator. Immediately after the Great East Japan Earthquake, the mismatch grew regarding professional and technical jobs, manufacturing process and labor affairs jobs and security jobs. However, clerical jobs made negative contributions to the growth rate of the mismatch indicator.

Figure 10 shows the mismatch status regarding subdivisions of job types presumed to have been affected significantly by the earthquake. In order to show which of the vacancy ratio and the unemployment rate is higher with regard to each job type, Figure 10 expresses the mismatch as the employment balance indicator used by Dario Sciulli, de Menezes and



Note: The selected job types are those for which the mismatch indicator showed a significant change in 2011 as shown in Figure 9. The authors selected subdivisions of job types for which the mismatch indicator showed a significant year-on-year change.

Figure 10. Employment Balance Indicator Regarding Specific Jobs

Vieira (2008) instead of as the mismatch indicator used by Jackman and Roper (1987). We first calculated the mismatch indicator with regard to each job type and arrived at the balance indicator through the formula $U_i/U - V_i/V$ without the use of absolute values. The balance indicator may take values between -1 and 1. The closer the value of the indicator is to 1, the larger the shortage of job offers is in relation to job applicants with regard to a relevant job type. The closer the value is to -1, the larger the shortage of job applicants is.

Regarding clerical jobs, there are usually more job applicants than job offers. After the Great East Japan Earthquake, the excess of job applicants was resolved temporarily. However, since June 2011, the number of job applicants has stayed higher than the number of job offers.

Regarding construction and civil engineering, labor supply and demand was balanced throughout 2010. However, after the earthquake, a labor shortage arose and has continued due to reconstruction-related demand. Regarding public health nurses, midwives, hospital

nurses as well as social welfare workers, there was already a labor shortage before the earthquake. In March 2011, when the earthquake occurred, the shortage worsened but has been improving gradually since April.

3. Time-Series Analysis of the Impact of the Earthquake on Employee Numbers, Wages and Working Hours

In this section, we estimate the impact of the earthquake on employment, wages and working hours. Figure 11 shows the seasonally adjusted employment, wage and working hours indexes (2005=100) for overall industries and for the manufacturing industry on a nationwide basis as published in the Monthly Labour Survey. Published figures are seasonally adjusted using the X-11 default setting of X-12-ARIMA, so the impact of outlier figures is unclear. Therefore, we made seasonal adjustments using the same method as was described in Section II. 2, and we did not observe any notable impact of outlier figures after the earthquake compared with the pre-earthquake level. Regarding the wage index, there are downward outliers, mainly in June and December. The presence of these outliers is presumed to reflect a decline in bonuses compared with the pre-earthquake level. When we compared these indexes and the nationwide industrial production index, we did not observe any notable correlation with regard to the employment and wage indexes. However, the working hours index declined temporarily at the time of the Lehman Shock and the Great East Japan Earthquake and later returned to the previous levels, and this was very similar to the movement of the nation-wide industrial production index. From this, it is clear that although the earthquake had little notable impact on employment and wages, working hours temporarily decreased presumably because companies adjusted working hours in response to the earthquake impact. However, compared with the response we observed at the time of the Lehman Shock, the adjustments were small, and the working hours index recovered to the pre-earthquake level in around six months.

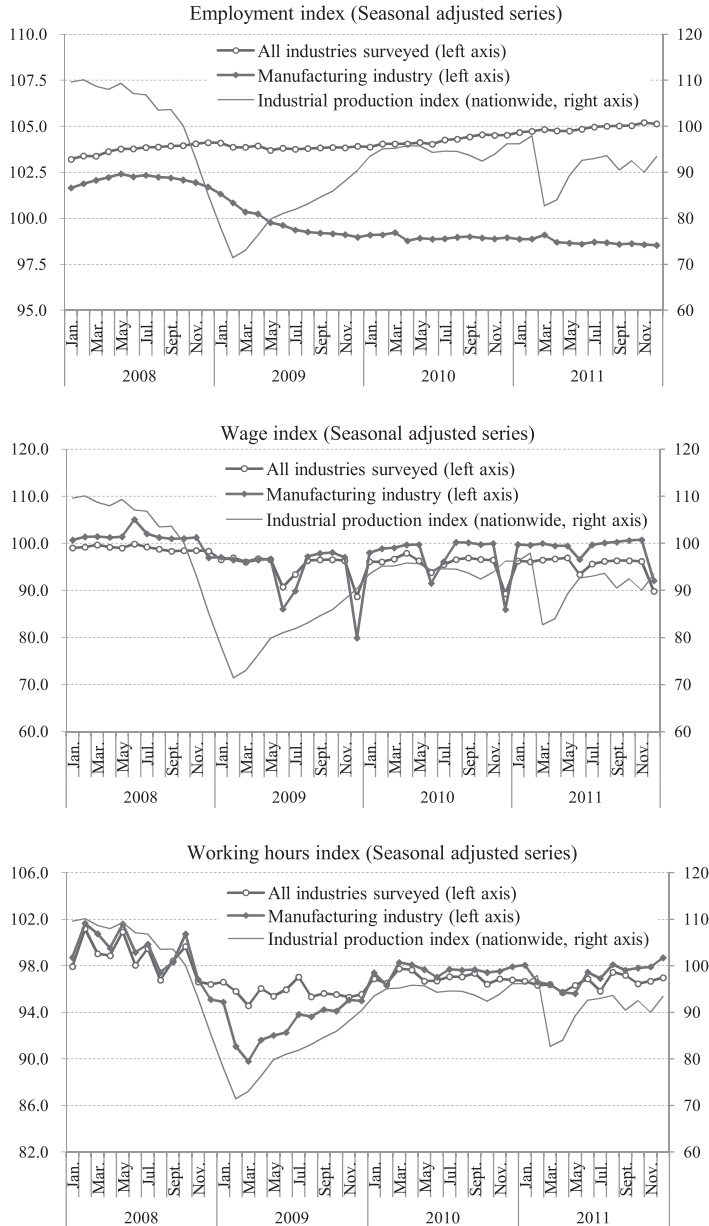
IV. Conclusion

This paper analyzed the impact of the Great East Japan Earthquake on industry, population movements and employments, mainly in the three disaster-stricken Tohoku prefectures (Iwate, Miyagi and Fukushima Prefectures) in light of past studies on the economic impact of major natural disasters.

The manufacturing industry, including the fishery product processing industry, which was the mainstay industry of those prefectures, suffered significant damage from the earthquake, with long-lasting effects.

The three prefectures have experienced an increase in net emigration since the earthquake. In Fukushima Prefecture in particular, the number of young emigrants rose rapidly due to the impact of the Fukushima Daiichi Nuclear Power Station. Net emigration from

The Impact of the Great East Japan Earthquake on the Labor Market



Source: Calculated based on the *Monthly Labor Survey*. (from January 1999 to December 2011) by the Ministry of Health, Labour and Welfare.

Note: The figure shows only the nationwide results because the survey regarding the three disaster-stricken Tohoku prefectures was suspended in some months after the earthquake.

Figure 11. Seasonally Adjusted Employment, Wage and Working Hours Indexes
(Overall Industries and the Manufacturing Industry)

Fukushima Prefecture has stayed higher than the pre-earthquake level since the earthquake impact as well as seasonal factors boosted the number of emigrants.

As for employment, the number of new job offers has increased in the three disaster-stricken Tohoku prefectures due to an increase in demand for post-earthquake reconstruction and a recovery in production in the manufacturing industry. Meanwhile, the number of applications for employment insurance benefits totaled around 220,000 (a year-on-year increase of around 40%) in the 10-month period from the occurrence of the earthquake. In the disaster-stricken areas, while there are many job offers for people with qualifications and skills related to “construction and civil engineering,” a mismatch between job offers and applicants has arisen. It is an important task to steadily improve the employment situation while taking account of the characteristics of the local industries.

As for the mismatch regarding the job type that has affected unemployed people in the disaster-stricken areas, a significant mismatch arose in April, the month after the earthquake, but the mismatch indicator later declined on a year-on-year basis. In August, a significant mismatch arose again. The mismatch grew particularly regarding professional and technical jobs, manufacturing process and labor management jobs and security jobs. Regarding construction and civil engineering, labor supply and demand was balanced throughout 2010. However, after the earthquake, a labor shortage arose and has continued due to reconstruction-related demand. Since peaking in August 2011, the mismatch regarding the job type has been declining. However, it continues to be an urgent task to resolve the mismatch, as it is necessary, in response to an increase in job applicants amid the lengthening of the period of unemployment, to promote skills development support so as to encourage displaced workers to look for a different type of job than the one in which they were engaged before the earthquake.

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Trends in Electricity Conservation Measures: Focusing on Responses by Industry Groups and Companies

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As well as the direct damage resulting from the earthquake itself, electricity supply and demand has become a major problem due to the accident at the Fukushima Daiichi Nuclear Power Plant triggered by the Great East Japan Earthquake. Accordingly, this paper discusses trends in electricity conservation measures in 2011 and the issues that arose as a result.

Broadly speaking, there are two types of characteristics in companies' electricity conservation measures. Firstly, overall trends concerning specific electricity conservation measures include a reduction in overtime, moving work start and finish times and total hours forward, changing the timing or length of summer holiday periods, and altering the prescribed days off. Secondly, differences were seen in the measures implemented, according to the characteristics of the business establishment in question. While there is a tendency for head offices to seek to conserve electricity by shortening total working hours, one can see a trend among factories and warehouses toward trying to promote electricity conservation by shifting the operating times, while maintaining the current working hours.

Problems that arose as a result of electricity conservation measures include the fact that they imposed a cost burden on companies. More specifically, these included increases in costs arising from the installation of private power generation equipment and co-generation to conserve electricity, inventory management costs, and labor costs resulting from weekend and night-time shifts.

Having said that, the electricity conservation carried out in FY2011 did not result solely in a cost burden being imposed on companies. Electricity conservation measures also had positive effects, in terms of making corporate management more efficient and diversifying individuals' ways of working.

I. Introduction

The damage resulting directly from the Great East Japan Earthquake on March 11, 2011 was immense, but one of the characteristics of this disaster was that its effects were not confined to this directly-inflicted damage, as the accident at the Fukushima Daiichi Nuclear Power Plant resulting from the earthquake also triggered major problems in regard to electricity supply and demand. The electricity supply and demand problems were not restricted to the areas served by Tokyo Electric Power Company and Tohoku Electric Power Company, but also spread to the areas served by Kansai Electric Power Company and Kyushu Electric Power Company, resulting in efforts being made to conserve electricity across the whole of Japan during the summer of 2011. These electricity supply and demand problems continue to be a major issue in 2012, and do not seem likely to be a purely temporary phenomenon.

This paper discusses trends in electricity conservation measures implemented in 2011 in the aftermath of the earthquake and the resulting issues, focusing primarily on a survey carried out by the Japan Institute for Labour Policy and Training and data that have already been published.

II. Electricity Supply and Demand Problems (Electricity Conservation Measures)

According to a report by the Ministry of Economy, Trade and Industry, within the area served by the Tokyo and Tohoku Electric Power Companies, which had set numerical targets for electricity conservation during the summer of 2011, if one compares the days when the air temperature was the same level as those of the previous year, one can see that the reduction among major commercial customers with contract demand of at least 500kW was 27% in the Tokyo region and 18% in the Tohoku region, while in a comparison of the maximum values, the reduction from the previous year was 29% in the Tokyo region and 18% in the Tohoku region. Even among small-scale commercial customers, with contract demand of less than 500kW, the reduction on the days when the air temperature was the same level as those of the previous year was 19% in the Tokyo region and 17% in the Tohoku region.¹ Thus, the initiatives of industrial sectors and individual companies had a reasonably positive effect, with their electricity conservation endeavors more than meeting the numerical targets. Details of the measures actually taken by companies and industries are examined below.

1. Company Initiatives

At the request of the government, companies implemented their own electricity conservation measures during the summer of 2011. Table 1 provides a summary of some examples of those initiatives.

As the table shows, companies are implementing measures in various ways. An urgent questionnaire survey concerning companies' responses to the disaster carried out by the Institute of Labour Administration provides an insight into the trends among specific electricity conservation measures being implemented or considered by companies (*Rosei Jiho* 2011). The sample size is not so large, but it is a very interesting survey in that it asks specifically about measures being implemented at head offices, factories and business offices.² Figure 1 shows a number of points that emerged from this survey that are worthy of attention.

¹ See Ministry of Economy, Trade and Industry, "Follow-up Concerning Electricity Supply and Demand Measures This Summer" (<http://www.meti.go.jp/press/2011/10/20111014009/20111014009-2.pdf>)

² The survey responses covered 105 head offices, 59 factories and warehouses, and 73 business offices and stores.

Table 1. Electricity Conservation Measures by Various Companies

<i>Komatsu</i> (Construction machinery)	Considered the utilization of private power generation in its factories and the flexible use of the holiday system in its office divisions, with a view to achieving its reduction target of at least 30%.
<i>Secom</i> (Security)	The company has a state-of-the-art data center with excellent energy conservation capabilities. Combines information security with electricity conservation.
<i>Fujifilm Holdings</i> (Precision chemistry)	Aimed to meet the target through mass introduction of LED lighting and full use of private power generators.
<i>Fujitsu</i> (Electrical machinery)	Relocated several thousand servers, with some shifted to Toyama Prefecture, in the area served by Hokuriku Electric Power Company, and others transferred to Hyogo Prefecture, in the area served by Kansai Electric Power Company. Private power generation was expanded at manufacturing bases.
<i>Panasonic</i> (Electrical machinery)	Further strengthened the home-working initiative and energy conservation efforts focused on machinery and devices at its business establishments that it was already promoting.
<i>Toshiba</i> (Electrical machinery)	Brought forward to the summer on a rotational basis the holidays of factory employees in the Greater Tokyo area that had been scheduled for the autumn.
<i>Softbank</i> (Communications)	Introduced cloud computing and distributed iPads and iPhones to all staff in an attempt to achieve a 30% reduction.
<i>Nippon Steel Corporation</i> (Steel)	Power purchased from external providers accounts for only 8% of its total electricity usage. Sought to conserve that 8% by switching operations to night shifts and carrying out annual repairs before the summer.
<i>Nippon Paper</i> (Paper manufacture)	Electricity conservation measures at head office included the introduction of summer time and the switching off of lights at 18:00.
<i>Mitsui Chemicals</i> (Chemicals)	Achieved 100% private power generation at its flagship Ichihara Works in Chiba Prefecture and maintained its 25% reduction target despite a cost increase.
<i>Coca-Cola (Japan) Company</i> (Soft drinks)	Achieved a 33% reduction in electricity consumption, far in excess of the government target, through stopping the cooling functions of each of its vending machines in turn.
<i>Seven & i Holdings</i> (Distribution)	Invested ¥10 billion in such initiatives as the introduction of LED lighting and solar photovoltaic power generation, with the aim of achieving a 25% reduction in electricity consumption at its 7-Eleven stores.

Table 1 (*Continued*)

<i>Showa Denko</i> (Chemicals)	Electricity conservation measures at its Ichihara Site, which is home to Showa Denko's Chiba Regional Office and Showa Denko Electronics, which produces electronic materials, such as computers and hard disk recorders, included switching operating times to night shifts and using private power generation.
<i>Oriental Land</i> (Theme park)	At the Tokyo Disneyland and Tokyo DisneySea theme parks, the company curbed use of indoor and outdoor lighting within the parks, while putting visitor safety first. It also sought to conserve electricity in non-customer-facing areas. Furthermore, it introduced private power generation.
<i>MORI Building</i> (Real estate)	The in-house power generation equipment that had been installed in the Roppongi Hills complex, which it operates, came into the limelight at the time of the earthquake and increased its brand power. For more than a month after the disaster, it supplied electricity to Tokyo Electric Power Company. It began to offer a service providing its tenants with data on their power consumption, with the objective of supporting their electricity conservation endeavors.
<i>Odakyu Electric Railway</i> (Railways)	Responded by reducing the number of its <i>Romansuka</i> limited express trains, revising its timetables, and partially halting the use of ticket machines, among other measures.
<i>Taiheiyo Cement</i> (Cement)	Curbed power consumption by devising appropriate shifts, while avoiding operations out of normal hours and on weekends, as much as possible, and supplied power to Tokyo Electric when it had spare capacity in its own private power generation.

Source: Compiled from *Keizaikai* (2011).

The top electricity conservation measures are “thorough implementation of overtime reductions,” “bringing forward work start and finish times,” “changing the timing and length of consecutive summer holidays,” and “altering prescribed days off (changing the original prescribed working hours from weekdays to weekends, through rotational shut-downs).” In particular, “bringing forward work start and finish times” showed less variation between head offices, factories and warehouses, and business offices and stores than any other option, so one could describe it as the main electricity conservation measure,³ which would be the easiest initiative to introduce, as they make it possible to conserve electricity during peak hours, without hindering normal operations.

Furthermore, “bringing forward work start and finish times” was one of the main electricity conservation measures among both manufacturing and non-manufacturing industry, so there is a tendency for it to be used as the main electricity conservation measure, ir-

³ 52.4% of head offices, 40.7% of factories and warehouses, and 39.7% of business offices and stores brought forward their work start and finish times.

respective of the industry type (*Rosei Jiho* 2011).⁴

On the other hand, “reducing the prescribed working hours each day,” “using modified working hours systems,” “introducing and extending flexi-time systems,” and “personnel shifts via transfers to areas outside those served by Tokyo and Tohoku Electric Power Companies” do not appear to have been considered very much as measures and seem to have been methods that were difficult to adopt as the main means of conserving electricity.

Moreover, at the head office, factory and business office level, one can see slight differences among the aforementioned measures, in terms of the importance attached to them. In particular, while head offices did not attach a great deal of importance to “reducing day shifts on weekdays and implementing evening and night shifts,” with 12.4% of these establishments introducing this measure, it was a major electricity conservation measure for factories and warehouses, being implemented by 32.2% of such establishments. A similar trend can be seen in regard to “altering prescribed days off,” a measure implemented by 52.5% of factories and warehouses, but only 36.2% of head offices. In contrast, while 18.1% of head offices introduced home-working, the share of business offices and stores introducing this measure was only half of this level, and hardly any factories or warehouses took this step (1.7%).

Among factories and warehouses, it is difficult to alter working hours, by reducing hours or changing the number of days of holiday or days off, but instead, they tried to deal with this by altering start and finish times, while maintaining the same length of working hours. On the other hand, one can see a tendency for head offices to seek to conserve electricity by reducing total working hours, by such means as “overtime reductions” and “changing the timing and length of consecutive summer holidays.”

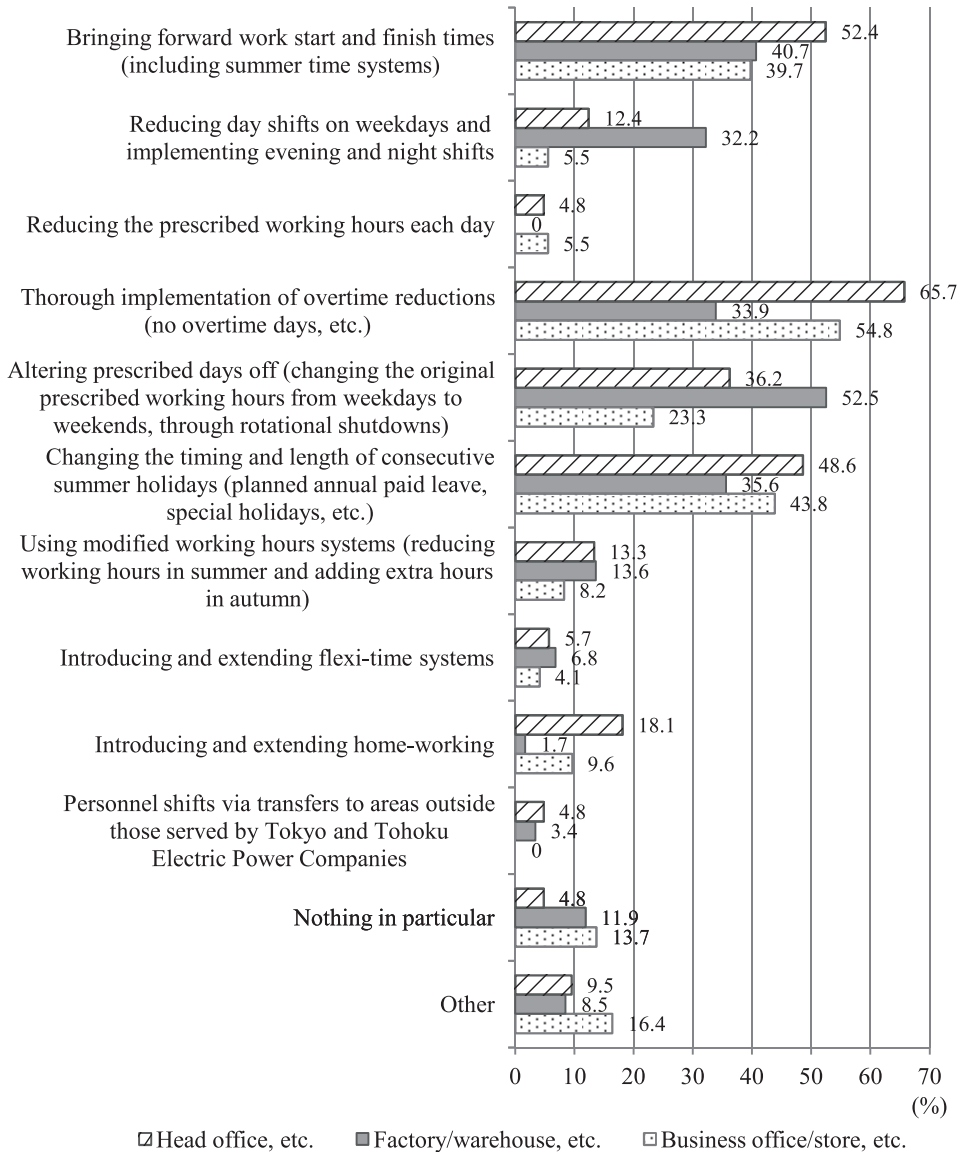
Thus, electricity conservation initiatives depend on the type of business establishment, such as whether it is a head office or factory, etc., rather than on the industry type.

The trends among business offices and stores are similar to those of head offices, lying somewhere in the middle between head offices and factories, but compared with those, one does not see any pronounced characteristics in terms of the types of measure introduced. Moreover, if one looks at the proportion of respondents answering “nothing in particular,” the highest share is accounted for by business offices and stores, so one can perhaps say that these are the business establishments at which it is hardest to implement electricity conservation measures.⁵ While it is not possible for such establishments to extend holidays or reduce overtime as freely as head offices, they cannot alter store opening hours as flexibly

⁴ Among head offices, it was the top measure, being implemented by 49.0% of companies in manufacturing industry and 55.4% of companies in non-manufacturing industry. Among factories and warehouses, it was implemented by 38.1% of companies in manufacturing industry (3rd) and 47.1% of companies in non-manufacturing industry (1st). Among business offices and stores, it was implemented by 33.3% of companies in manufacturing industry (3rd) and 45.0% of companies in non-manufacturing industry (1st).

⁵ Whereas the proportion of respondents answering “nothing in particular” was 4.8% among head offices and 11.9% among factories and warehouses, it was 13.7% among business offices and stores.

Trends in Electricity Conservation Measures



Source: Compiled from *Rosei Jiho* (2011, 13).

Figure 1. Details of Electricity Conservation Measures (Multiple Responses)

as factories can change their hours of operation, so there is a possibility that electricity conservation measures are difficult for them to implement.

The main challenges arising from electricity conservation measures are “it is difficult to forecast the amount of electricity that should be conserved (45.6%),” “it is difficult to secure the understanding of business partners and customers (38.9%),” and “discussions

with labor unions and employee representatives (convincing staff and securing their understanding) (30.0%).”⁶ The first issue can be resolved by providing numerical targets, but the latter two are problems relating to dealings between companies and labor-management relations within companies, so it is anticipated that they could form a bottleneck hindering electricity conservation.

2. Industry Initiatives

As described above, each company implemented its own electricity conservation measures. One example of initiatives being undertaken as an industry, cutting across the boundaries between companies, can be seen in the motor vehicle industry. The Japan Automobile Manufacturers Association (hereinafter referred to as JAMA) spearheaded electricity conservation initiatives across the whole of the sector, so this industry is worthy of attention. Unlike the initial proposal, the actual rotating shutdowns involved taking Thursdays and Fridays as scheduled days off and then operating on Saturdays and Sundays, but it would seem to be worth leaving a record of what JAMA’s initial proposal was, so let us touch upon this below.

(1) JAMA Initiatives

At a meeting of the Nippon Keidanren (Japan Business Federation) to discuss measures to curb electricity demand during the summer, held on April 15, 2011, JAMA proposed “rotating days off,” involving different industries switching their days off to different days. The JAMA proposal sought to reduce peak power demand by changing from a system of taking days off on weekends, when electricity demand is lower than on weekdays, and allocating days off on weekdays between industries in order to equalize electricity demand throughout the week; the specific details were as follows.⁷

In order to combine the curbing of peak power demand with industrial activities, JAMA put forward a basic policy focused on the following two approaches: (i) individual companies maximizing their efforts to conserve electricity in order to avoid rolling blackouts, based on the premise of seeking to avoid any impact on production activities,⁸ and (ii) industry-wide initiatives in parallel with this, aimed at achieving an even greater peak power suppression effect. One measure proposed that was focused on the second approach,

⁶ Multiple answers were requested, so the total for the top three responses is greater than 100%.

⁷ For further details, see Japan Automobile Manufacturers Association “*Kaki Denryoku Juyo Yokusei ni Muketa Rinban Kyujitsu/Kaki Kyujitsu Shifuto no Goteian* (A Proposal for Rotating Days Off and Shifting Summer Holidays Aimed at Curbing Electricity Demand During Summer)” (www.keidanren.or.jp/japanese/policy/2011/029/shiryo3-1.pdf).

⁸ Rolling blackouts were implemented for a time in the immediate aftermath of the disaster, with the objective of keeping the quantity of power used within the supply capacity of the electric power companies. For further details, see Tokyo Electric Power Company “Implementation plan of rolling blackout on and after Tue, March 15, 2011” (<http://www.tepco.co.jp/en/press/corp-com/release/11031313-e.html>).

which was aimed at achieving an even greater peak power suppression effect, was the rotation of days off and long-term holidays within and across industries. One could say that the advocacy of electricity conservation initiatives that go beyond the level of individual companies is a characteristic of JAMA.

One factor behind JAMA's proposal was the fact that there was a large gap between electricity demand on weekdays and on weekends. According to materials submitted by JAMA, whereas peak electricity demand is 58 million kW on weekdays, it is 48 million kW on weekends, so if rotating shutdowns could be used to equalize the gap between weekdays and weekends that results from days off being concentrated on Saturdays and Sundays, it would be possible to curb peak demand on weekdays without reducing the number of hours worked.

Let us now look at the specific proposals. JAMA put forward two measures as methods that would make it possible to curb peak power demand on weekdays, while maintaining normal, full-strength operations. The first involved dividing the 12 companies belonging to JAMA into seven groups, in order to create groups with uniform demand, and allocating days off between the seven groups in such a way that two groups would always be on their days off on any given day of the week, as follows: (i) Monday & Tuesday; (ii) Tuesday & Wednesday; (iii) Wednesday & Thursday; (iv) Thursday & Friday; (v) Friday & Saturday; (vi) Saturday & Sunday; and (vii) Sunday & Monday.

Tables 2 and 3 express this system in tabular form. As can be seen from Table 2, whereas peak power demand on weekdays in each group is 1,000 kW, it is only 400kW on weekends. As a result, there is a large gap between peak power demand on weekdays and that on weekends. The main purpose of the proposal was to seek to even out these differences by implementing rotating shutdowns. The shaded cells in Table 3 show the groups with rotating shutdowns on those days.

As can be seen from the peak power demand rows in Tables 2 and 3, if rotating shutdowns are carried out, it becomes possible to curb peak power demand while maintaining the normal number of hours worked. Thus, JAMA asserted that the amount of weekend power consumption could be allocated to one or other of the weekdays and peak demand for power on weekdays could therefore be reduced by implementing rotating shutdowns.

The second initiative involved distributing the summer holidays usually taken from August 6 to 14 over a period of about a month, from the beginning of the school summer holidays on July 25 through to the end of August. In this case as well, JAMA proposed splitting the 12 companies into four groups, dividing them as evenly as possible in terms of their electricity demand, and having them take their summer holidays in such a way as to avoid coinciding with the traditional *obon* holiday (August 13 to 15) as far as possible.

JAMA estimated that implementing these initiatives would enable weekday peak power consumption during the third quarter of the calendar year to be reduced by 18% in July, 21% in August and 17% in September.

However, peak power demand for JAMA alone accounts for no more than 4% of the

Table 2. Peak Power Demand If Rotating Shutdowns Were Not Implemented
(Unit: kW)

	Mon	Tues	Wed	Thurs	Fri	Sat	Sun
Group A	1000	1000	1000	1000	1000	400	400
Group B	1000	1000	1000	1000	1000	400	400
Group C	1000	1000	1000	1000	1000	400	400
Group D	1000	1000	1000	1000	1000	400	400
Group E	1000	1000	1000	1000	1000	400	400
Group F	1000	1000	1000	1000	1000	400	400
Group G	1000	1000	1000	1000	1000	400	400
Peak Power Demand	7000	7000	7000	7000	7000	2800	2800

Source: Compiled from Japan Automobile Manufacturers Association, *Kaki Denryoku Juyo Yokusei ni Muketa Rinban Kyujitsu/Kaki Kyujitsu Shifuto no Goteian* [A proposal for rotating days off and shifting summer holidays aimed at curbing electricity demand during summer].

Table 3. Changes in Peak Power Demand through Rotating Shutdowns
(Unit: kW)

	Mon	Tues	Wed	Thurs	Fri	Sat	Sun
Group A	1000	1000	1000	1000	1000	400	400
Group B	1000	1000	1000	1000	400	400	1000
Group C	1000	1000	1000	400	400	1000	1000
Group D	1000	1000	400	400	1000	1000	1000
Group E	1000	400	400	1000	1000	1000	1000
Group F	400	400	1000	1000	1000	1000	1000
Group G	400	1000	1000	1000	1000	1000	400
Peak Power Demand	<u>5800</u>	<u>5800</u>	<u>5800</u>	<u>5800</u>	<u>5800</u>	<u>5800</u>	<u>5800</u>

Source: Same as Table 2.

demand from all major commercial customers. Accordingly, JAMA called on all industries and companies to cooperate in implementing the concept of rotating days off and shifting summer holiday periods on a larger scale, with a view to achieving “smart curbs on peak demand without reducing the number of hours worked.” JAMA’s proposal involved rotating days off and shifts in summer holidays among a number of industries and companies, so that ultimately industry/company A would take its days off on Mondays and Tuesdays, while industry/company B would take its days off on Tuesdays and Wednesdays, etc. From this, one can see that JAMA envisaged implementing these measures on a scale beyond that

of a single industrial sector.

(2) Initiatives in the Department Store Sector

Outside manufacturing industry as well, there are sectors that are implementing initiatives aimed at electricity conservation throughout the sector as a whole. A leading example of this is the department store sector. The department store sector is one in which suspensions of electricity supply, through rolling blackouts, etc., became a particularly serious problem.

In the department store sector, the impact of secondary damage from reduced opening hours due to rolling blackouts was much greater than the harm resulting directly from the disaster. It takes time for electricity to return to POS (point-of-sale) systems and to check the safety of equipment, so when blackouts occur, it is necessary to close the store for an hour or two either side of the power outage. Consequently, some stores had to completely abandon their business that day. As a result, department store turnover in the Kanto region demonstrated a hitherto-unprecedented major fall of 21.5% in March 2011, in the immediate aftermath of the disaster (Japan Institute for Labour Policy and Training 2011). It is a sector in which electricity problems have a major impact on business, due to their effects on systems that form the basis of their operations, such as POS systems.

In response to this situation, the Japan Department Stores Association established a committee to examine countermeasures, which carried out a simulation of the degree to which each member company within the area served by Tokyo Electric Power Company could reduce power consumption through various electricity conservation measures, without implementing rotating shutdowns. As a result, it was ascertained that each member department store could achieve reductions of 13-25%, so on May 13, the Association published the “Guidelines for Electricity Conservation at Department Stores” and put together a checklist, after which it provided individual companies with support in formulating concrete action plans.

(3) Cases in Which Electricity Demand Did Not Become a Major Problem (Where the Sale of Power Was Possible)

Incidentally, there were some sectors in which electricity conservation was not that great a problem.⁹ For example, in the paper industry, pulp and paper mills have boilers that generate heat within the plant, so they are able to carry out private power generation, enabling them to cover the majority of their electricity needs themselves. The Japan Paper Association says that “it is possible to sell electricity by putting spare boilers into service,” and some companies have actually started to consider the option of selling electricity to power

⁹ Here, not being a problem refers to the fact that plants are able to supply the power required for their operations themselves. Naturally, there is a possibility that the costs involved in this could become a major problem. The problems arising from securing such electricity will be dealt with in Section III of this paper.

companies. Moreover, in the oil sector, oil refineries are equipped with private power generation facilities and some are working on selling electricity generated on this basis (Japan Institute for Labour Policy and Training 2011).¹⁰

Thus, there are sectors in which the suspension of power supply from electricity companies due to rolling blackouts, etc. would not have that great an impact on plant operation. Moreover, in such sectors, it is actually possible to sell electricity to electric power companies.

Mitsui Chemicals, which is one of the companies listed in Table 1, is introduced here as a company implementing an initiative focused on the sale of electricity.¹¹ Mitsui Chemicals, which is a chemical manufacturer, has its private power generation equipment at its flagship Ichihara Works operating at full capacity, so that as well as avoiding having to purchase any electricity at all from Tokyo Electric Power Company, it is able to sell its surplus power back to the latter company.¹² In return for supplying the surplus power, Mitsui Chemicals charges Tokyo Electric Power Company the cost of the fuel required to generate the power supplied, thereby seeking to mitigate the burden of fuel costs resulting from power generation. There are two important points here. The first is that it is actually possible to sell the power generated at a factory. The second is that private power generation entails the problem of how to cover the requisite fuel expenses.

Thus, although it is possible to acquire the electricity required for operations without depending on a power company, this also has the potential to give rise to new problems. The next section examines the problems arising from electricity conservation measures.

III. Problems Arising from Electricity Conservation Measures

1. Increase in Costs Arising from Electricity Conservation

This section examines the issues arising from electricity conservation, with reference to the Agency for Natural Resources and Energy, “*Kaki no Denryoku Jukyu Taisaku no Foro-appu ni Tsuite (Oguchi, Koguchi, Katei ni Okeru Torikumi no Kensho)* (Follow-up Concerning Summertime Electricity Supply and Demand Measures [Review of Initiatives by Large-scale, Small-scale and Household Customers]).”¹³

¹⁰ Naturally, in the oil sector, even where private power generation is possible, measures focused on power peak cuts are being implemented in areas other than plants, such as in offices and at refineries and oil terminals.

¹¹ For further details regarding the case of Mitsui Chemicals, see *Nikkei Ecology* (2012).

¹² It supplied approximately 40,000kW to Tokyo Electric Power Company between July and September 2011.

¹³ For details of examples unable to be covered in this paper, see Agency for Natural Resources and Energy, “*Kaki no Denryoku Jukyuu Taisaku no Foro-appu ni Tsuite (Ooguchi, Koguchi, Katei ni Okeru Torikumi no Kenshou)* (Follow-up Concerning Summertime Electricity Supply and Demand Measures [Review of Initiatives by Major and Small-scale Commercial Customers and Household Customers])” (<http://www.meti.go.jp/press/2011/10/20111014009/20111014009-3.pdf>).

Firstly, problems for large-scale commercial customers¹⁴ include the increase in costs arising from private power generation and the replacement of lighting equipment in order to conserve electricity. Of the 20 large-scale commercial customers profiled in the report, as many as 14 cited private power generation and co-generation as factors behind cost increases arising from electricity conservation, so one can see that even if companies secured the necessary power while conserving electricity, they incurred a commensurate cost burden. In particular, the problem of cost increases arising from private power generation was pointed out by companies in manufacturing industry, including both the metals and non-metals sectors¹⁵. Although private power generation was not cited by those in the distribution and other (office-based) categories, respondents in these sectors did point out an increase in costs due to changing lighting equipment (introduction of LED lighting).

Furthermore, cost increases resulting from electricity supply and demand problems affected not simply private power generation and changes of lighting equipment, but also had an impact on inventory management costs and labor costs. Among companies in the chemicals sector were some that front-loaded production in June, ahead of the electricity conservation period, in order to avoid having to reduce production due to cuts in daytime peak power demand, which resulted in their having inventory that would not have arisen under normal circumstances. The costs arising from such things as the purchase of packaging materials due to inventory accumulation amounted to approximately ¥180 million, which was a considerably rise in costs due to electricity conservation measures.

In addition, labor costs also rose among companies that altered their operating hours and switched to shifts at night and on weekends, in order to conserve electricity at peak times. It is not known precisely how much this actually amounted to, but for example, one motor vehicle company has stated that its labor costs increased by 1.3 times, while in the non-metals sector, a company manufacturing optical fibers and power lines reported a rise of 1.2 times.

On the other hand, among small-scale commercial customers, due to the fact that their operations had to conform to the weekend shifts introduced by large corporations, small and medium-sized enterprises, whose business partners cover a multitude of sectors, were apparently compelled to operate without any days off, as they had deadlines set for both weekdays and weekends.

¹⁴ Large-scale commercial customers are consumers (business operators) with a contract demand of at least 500kW, while small-scale commercial customers are consumers (business operators) with a contract demand of less than 500kW.

¹⁵ Two out of three companies in the chemicals sector, three out of three in the non-metals manufacturing sector, two out of three in the electronics manufacturing sector, three out of three in the motor vehicle sector, and three out of three in the precision instruments and household electrical appliances sector cited this as a factor. In addition, although there is only one example in the steel sector, that one company also indicated this as a factor behind cost increases. Moreover, as an aggregate answer of 15 major companies in the steel sector, the problem of cost increases due to private power generation is also mentioned.

From the information above, one can see that companies bore costs resulting from electricity conservation, due to such factors as the use of private power generation, production adjustment and inventory management, and increases in labor costs due to the shifting of operations to weekends and nights. Although there are differences in degree, cases have been reported in which the costs amount to the equivalent of hundreds of millions of yen on a company scale, and billions of yen when looked at across an entire industry, so one can say that the cost burden of electricity conservation is an issue that cannot be overlooked. Moreover, the issues pointed out by small and medium-sized enterprises demonstrate that it is necessary to give further consideration to the formulation of industry-wide rules concerning operating times. What kind of measures should be taken in response to these problems is a key issue for the future.

2. Electricity Problems Other Than Issues of Electricity Supply and Demand

The electricity problems triggered by the nuclear power plant accident also affect industry sectors in ways other than those relating to issues of electricity supply and demand. For example, in the department store sector, a tendency for foreign tourists to avoid visiting Japan in the aftermath of the earthquake led to a decline in sales at department stores, not only in disaster-stricken areas, but also nationwide.

If one looks at the trends in visits to shops by and turnover from foreign tourists in March 2011, one can see that the number of shoppers plummeted by 44.2% compared with the previous year, while turnover also slumped, falling by 52.2% compared with the previous year. The primary factor behind this was the fall in the number of tourists from China, South Korea and Hong Kong, who accounted for the overwhelming majority of tourists before the disaster (Japan Institute for Labour Policy and Training 2011). Visitors from overseas are extremely important customers for department stores, which are trying to increase sales amid a shrinking domestic market. Thus, electricity problems had an impact on the economy other than in terms of supply and demand.

IV. Electricity Conservation, Corporate Management and Individual Ways of Working

This section returns to the subject of initiatives by companies, looking at examples in which electricity conservation measures have had some kind of impact on management or individual ways of working, as well as pointing out the possibility that recent efforts to conserve electricity have led to greater management efficiency and a diversification in individual ways of working. Below, Komatsu, Seven-Eleven Japan and FamilyMart are profiled as examples in which the implementation of electricity conservation measures provided an opportunity to make corporate management more efficient, while Isetan Mitsukoshi Holdings (hereinafter referred to as “Isetan Mitsukoshi HD”) and KDDI are examined as cases in

which one can see the possibility that measures to conserve electricity are bringing about a change in individual ways of working. These examples are worthy of attention, in that they provide an insight into other aspects of the effects of electricity conservation measures.

1. Reforms in the Production Process Itself Triggered by Electricity Conservation

Among the companies listed in Table 1, which provided a summary of companies' electricity conservation initiatives, are some which took the opportunity offered by the conservation of electricity to improve their business operations. For example, in the process of its electricity conservation activities, the construction machinery manufacturer Komatsu discovered that more electric power was being wasted in its factories than had been envisaged.¹⁶ More specifically, a succession of instances of electricity being wasted became apparent, such as in the devices used to plane construction machinery frames and in processes including cooling and heat treatment. In response to this, the company initiated endeavors to reduce peak electricity usage through reforms of production processes.

The company firstly revised the heat treatment process, which alters the hardness and properties of the construction machinery components. Hitherto, the metal was machined into its final shape while undergoing repeated rounds of heating and cooling, but the company took up the challenge of establishing a new production process in which a single round of heat treatment is used toward the end of the process of manufacturing the finished item, after almost all of the machining of the component has been completed. Through this, the company is aiming to reduce the amount of electricity used per component. Moreover, it has also rethought the welding process, which is essential to the assembly of construction machinery.

As well as reforms in the manufacturing division, the company's design division has also begun to consider revising the blueprints it uses, from the perspective of reducing electricity consumption, with the aim of achieving design that leads to a reduction in processing time. These initiatives are being carried out because, even if the effect per component is minimal, the amount of power consumption that can be reduced overall is significant, if the design of the product as a whole can be revised. In addition, the company is apparently also attempting to curb electricity consumption by curtailing the use of air conditioning and lighting through the consolidation of production lines within factories.

Moreover, in order to ensure that electricity conservation measures identified in one factory are shared throughout the company, a subcommittee that enables engineers in each field to share information beyond individual factory boundaries has been established. Thus, the company is building up a structure that enables it to ensure that if new production techniques relating to electricity conservation become established in one factory, they can be spread laterally to other factories.

As well as seeking a 50% reduction in peak power usage compared with the FY2010

¹⁶ See *Nikkei Business* (2012) for the example of Komatsu outlined below.

level by FY2014 through a range of initiatives, Komatsu is aiming to halve its total electricity consumption, with the objective of cutting electricity procurement costs by approximately ¥4 billion annually on a non-consolidated basis.

As can be seen from the aforementioned initiatives, electricity conservation during the summer of 2011 triggered by electricity supply and demand problems has also had the effect of bringing to light hitherto-unnoticed waste in production processes and encouraging more efficient management.

2. Cost Reductions through Electricity Conservation

As shown in Table 1, in April 2011, Seven-Eleven Japan, which develops convenience stores as franchise chains, set a target of achieving a reduction in electricity consumption of approximately 25% compared with the previous year, and has been implementing electricity conservation initiatives at around 6,000 stores within the area served by Tokyo Electric Power Company.¹⁷ The main electricity conservation measures have focused on replacing equipment in stores, such as switching to LED lighting¹⁸ and replacing air conditioners, refrigeration cases and microwaves with energy-conserving models. In addition, solar panels have been installed in 1,000 stores.

The financial burden resulting from these initiatives was not inconsiderable, amounting to approximately ¥10 billion. However, at the same time, the introduction of such energy conservation measures also has advantages for both the franchise owners and Seven-Eleven Japan, as they have brought about a reduction in the running costs of stores.¹⁹

Thus, electricity conservation measures are also contributing to making management more efficient, through efforts to reduce store running costs. Furthermore, FamilyMart, which is also in the distribution industry, is aiming to deploy on a global scale the experience it gained from electricity conservation in 2011. At the AFC Summit, an annual conference of FamilyMart executives, which was held in Shanghai on November 1, 2011, a plan was approved to reduce electricity usage by 20% from the 2010 level by 2015 at approximately 20,000 stores in seven countries and regions around the world, including Japan, as well as Taiwan, South Korea, China, Thailand, and Vietnam.²⁰

One of the factors encouraging global deployment of electricity conservation is the belief that has spread throughout the company since the Great East Japan Earthquake, that systems that can deal with unprecedented risks, such as earthquakes and other disasters, should be put in place in each country. Compared with Japan, emerging nations such as Vi-

¹⁷ See *Nikkei Ecology* (2012) for the example of Seven-Eleven Japan outlined below.

¹⁸ The lighting at 5,000 of the approximately 6,000 stores within the area served by Tokyo Electric Power Company has been switched to LED lighting.

¹⁹ See also the following statement by Seven-Eleven Japan's PR team. "It is somewhat hard to recognize the effects due to increases in electricity charges and other factors, but there is no doubt that this has led to a reduction in costs for stores in the chain." (*Nikkei Business* [2011, 11])

²⁰ See *Nikkei Business* (2011) for the example of FamilyMart.

etnam and China have a great deal of scope for conserving electricity, so a considerable electricity conservation effect can apparently be anticipated, simply from installing the latest refrigeration case and air conditioner models.

Thus, there are companies that are applying the knowledge they have gained from electricity conservation to their overseas operations, with the aim of making their stores around the world more efficient.

3. Promotion of Improvements in Management Efficiency and a Better Work-Life Balance

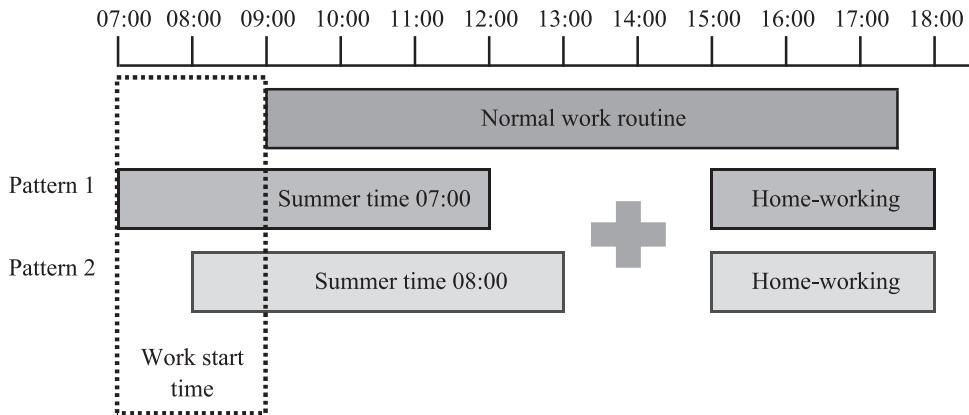
There are also companies that are taking the opportunity offered by electricity conservation measures to try to rethink approaches to management and ways of working. Isetan Mitsukoshi HD, which is one of the major players in the department store sector, decided to take the opportunity offered by electricity conservation measures to reinstate store closing days on weekdays and reduce opening hours. This can be said to be of no small significance, as it is a sign of change in the trend toward increasing the number of days on which shops open and extending opening hours, which has been ongoing since the 1990s.

February and August, which are known as “*nippachi*” (after the names of the months) in the department store sector, are usually periods of sluggish growth in turnover. Accordingly, Isetan Mitsukoshi HD decided to introduce store closing days at three stores in the Kanto region during August, when sales traditionally declined, as it was more efficient from a business perspective to reduce the number of days on which stores opened during this period. It was apparently eight years since a store closing day had been in place. As well as making management more efficient, this initiative apparently also became the focus of attention within the department store sector because it helped to promote a better work-life balance for employees (Japan Institute for Labour Policy and Training 2011).

The initiative subsequently continued and is spreading among a greater number of stores. In February 2012, the store closing day initiative was expanded to include all nine stores within the Tokyo metropolitan area, and it was announced that reduced opening hours would be introduced at a specific store, for the first time since the 1973 oil crisis, 39 years earlier.²¹ More specifically, store opening hours were cut by an hour, going from 10:00–20:00 under normal circumstances to 10:30–19:30 for a period of about half a month from mid-February. In conjunction with this, employee working hours also changed from a two-shift system, with a 09:45–19:10 shift and a 10:45–20:10 shift, to all staff working from just after 10:00 until just after 19:30.

Furthermore, in August 2012, the company plans to expand the focus of the reduced opening hours initiative to cover five major stores, including the Ginza and Nihonbashi branches of Mitsukoshi, as well as extending the duration of the initiative from a couple of

²¹ See *Sankei Biz* article dated November 1, 2011 (<http://www.sankeibiz.jp/business/news/111101/bsd1111011105003-n1.htm>).



Source: Compiled by the author from *Nikkei Ecology* (2011).

Figure 2. Image of the Combined Summer Time and Home-Working System

weeks to one month.²² Although the opening hours differ at the stores concerned, the changes at each store will result in a reduction in opening hours of between 30 minutes and one hour.²³

As a result, while the total number of hours worked each month will not change, it is anticipated that the number of days on which staff can go home earlier will increase. Moreover, as well as being an electricity conservation measure, such initiatives are being implemented with the objective of reducing costs and improving customer service through a better working environment, so one can see that the recent electricity problems have the potential to effect changes in various forms, in terms of increasing the quality of service and improving the work-life balance of employees.

4. Home-Working

One can see cases in which electricity conservation measures did not simply trigger the introduction of home-working, but also led to the system being applied to many staff. For example, the information and communications provider KDDI implemented an initiative focused on curbing the amount of power used at head office by combining home-working with the introduction of a summer time system.²⁴

More specifically, it involves staff starting work an hour or two earlier than usual, working for five hours at the office, and then completing the remaining 2.5 hours of work at home in the afternoon (Figure 2). Approximately 40% of the staff at head office are using this working pattern. As a result of this initiative, as well as conserving electricity through

²² In February 2012, this was introduced at the Isetan Shinjuku flagship store only.

²³ See *Nihon Keizai Shinbun* article dated June 2, 2012.

²⁴ See *Nikkei Ecology* (2011) for the example of KDDI.

economizing on air conditioning and lighting, the company succeeded in achieving a 62% reduction in peak power consumption at head office in July 2011, compared with the previous year. Broken down by morning and afternoon consumption, electricity consumption was cut by approximately 50% in the morning, when workers are in the office, and by about 70% in the afternoon, when many staff are working from home. Although it is not possible to make a simple comparison, one can see that home-working systems can be effective in conserving electricity at offices.²⁵

Incidentally, the electricity usage situation peculiar to this industry can be seen in the background to the decision to implement this initiative. At least 90% of electricity used by the company arises from communications equipment at its telecommunication bases. It has 13 business establishments with contract demand of at least 500kW in the area served by Tokyo Electric Power Company, which are therefore subject to the 15% reduction target. However, as it is necessary for telecommunication bases to operate around the clock, they became one of the business establishments at which it was difficult to make the requisite operational adjustments. This characteristic of the information and communications industry is thought to have been one factor behind KDDI's decision to promote electricity conservation through changes to ways of working, including the introduction of home-working.

At any rate, the fact that many staff have taken the opportunity offered by the electricity conservation measures to adopt home-working suggests that there is a possibility that such measures are triggering diversification in ways of working.

V. Conclusion

1. Summary of Findings

(1) Characteristics of Electricity Conservation Measures

Let us first of all look at electricity conservation measures undertaken by companies. Firstly, overall trends concerning specific electricity conservation measures include a reduction in overtime, moving work start and finish times forward, changing the timing or length of summer holiday periods, and altering the prescribed days off. Secondly, some differences were seen in the measures implemented, according to the characteristics of the business establishment in question. While there is a tendency for head offices to seek to conserve electricity by shortening total working hours, there is a trend among factories and warehouses toward trying to promote electricity conservation during peak hours by shifting the operating times, while maintaining the current working hours.

²⁵ Another initiative involves having whole floors or departments take the five-day summer holiday to which they are entitled between July and September at the same time, in order to conserve electricity.

(2) Problems Arising from Electricity Conservation Measures

Looking back on the results achieved in 2011, the reduction in electricity consumption exceeded the target and companies' initiatives have yielded generally positive outcomes, in terms of conserving electric power. However, electricity conservation has given rise to a commensurate cost burden for companies. This demonstrates that the recent electricity conservation endeavors entailed some pain for companies. Factors behind the cost increases included increases in costs arising from the installation of private power generation equipment and co-generation to conserve electricity, inventory management costs, and labor costs resulting from weekend and night-time shifts.

(3) Other Effects of Electricity Conservation

Having said that, as described in Section IV of this paper, the recent electricity conservation endeavors did not result solely in a cost burden being imposed on companies. One would also wish to stress here that the electricity conservation measures implemented in 2011 also triggered greater efficiency in corporate management among some companies and industries. In this sense, electricity conservation measures are helping to strengthen the competitiveness of companies.

At the same time, efforts to reduce electricity consumption are having an impact on individual ways of working. Although one could not say that electricity conservation measures are becoming that widespread, there are companies that have taken the opportunity offered by the need to conserve electricity to popularize home-working among their employees. Moreover, in the department store sector, in which there had hitherto been a sustained trend toward increasing the number of days on which stores opened and extending opening hours, one major company not only introduced store closing days, but also decided to reduce opening hours. Such changes have the potential to have some effect on the work-life balance.

2. Ongoing Observation and Studies Required

The electricity supply and demand problems triggered by the Great East Japan Earthquake—including the question of how to construct a next-generation electricity supply and demand system—are issues affecting not only the disaster-afflicted areas, but also the whole of Japan. The question of how the electricity conservation measures implemented by companies bring about (or fail to bring about) a metamorphosis in individual ways of working in future could become a profoundly interesting theme in labor research. If they do give rise to a metamorphosis, they could become a major theme in their own right as a change in the way of working itself; if not, then they will become a deeply interesting theme representing the rigidity of Japanese people's ways of working.

However, before all of this, one must ask why, for example, the rotating shutdowns proposed by JAMA could not be implemented according to the initial plan, and why they

have not spread as a method that transcends the boundaries between industrial sectors. It will be necessary to carry out a proper follow-up regarding such questions. Moreover, as can be ascertained from the passages concerning the responses of individual companies, there were quite a few companies that cited problems relating to dealings between companies (relationships with business partners and clients) and labor-management relations within the company as issues arising from efforts to conserve electricity. The issue of electricity conservation being faced by companies and its relationship to inter- and intra-company business practices could become a valuable topic in endeavors to shed new light on the characteristics of Japanese companies.

At any rate, from the perspective of contributing to academic research as well, rather than ending as a temporary boom, it would be desirable to maintain an interest in the range of responses implemented in relation to the disaster and conduct regular observation and studies on an ongoing basis.

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Impacts of the Great Hanshin-Awaji Earthquake on the Labor Market in the Disaster Areas*

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This paper examines the short-, medium- and long-term impacts of the 1995 Great Hanshin-Awaji Earthquake, which, like the 2011 Great East Japan Earthquake, inflicted devastating damage, on the labor market of the disaster-affected areas. This analysis might help us draw up a long-term vision of the reconstruction of the eastern Japan areas devastated by the Great East Japan Earthquake. To sum up our findings, regarding part-time workers, the number of new vacancies increased in the short term while the number of new job seekers declined and the number of job placements also dropped steeply. The number of job placements rebounded substantially in the medium term but fell back later. Regarding full-time workers, it was empirically observed that the growth in the number of job placements declined steeply even though the growth in the numbers of new job seekers and new vacancies rose or remained flat compared with the pre-earthquake level. This is presumed to be due in part to a mismatch between labor supply and demand. The number of job placements for full-time jobs recovered by 1999 (in the medium term) but declined later.

I. Introduction

It has been one and a half year since an earthquake and tsunami disaster of an unprecedented scale inflicted devastating damage in East Japan, mainly in the Tohoku region. The Great East Japan Earthquake and the ensuing tsunami killed or left missing around 20,000 people, and deprived numerous people of their homes and properties. Although it seems that the removal of debris and reconstruction work are proceeding, the site of an interim storage facility for soil polluted as a result of the nuclear accident at Tokyo Electric Power Company's Fukushima Daiichi Power Station, which was triggered by this natural disaster, has not yet been determined as of one year after the disaster.¹ The employment situation remains halfway through recovery. The period of the provision of unemployment benefits has been extended by four months in the disaster areas as an extraordinary measure. However, benefits recipients are beginning to reach the end of the extended provision period. As reported by the Sankei Shimbun newspaper on February 9, 2012, the Ministry of

* We would like to express our appreciation to Kohei Aono, a lecturer at Ritsumeikan University, for helping us write this paper by providing advice regarding time series analysis, and to the Hyogo Labour Bureau for supplying job placement services statistics. Any problems or inaccuracies concerning this paper are attributable to the authors.

¹ As of February 28, 2012.

Health, Labour and Welfare announced that up to 7,100 people will reach the end of the provision period of unemployment benefits in the January-March quarter of 2012 in the three disaster-stricken prefectures: Iwate Prefecture, Miyagi Prefecture and Fukushima Prefecture. Obviously, it is an urgent task to provide employment opportunities to people who have lost unemployment benefits. On the other hand, we see signs of a recovery in the employment situation. In December 2011, the effective ratio of job offers to seekers was 0.71 in Iwate, 0.80 in Miyagi and 0.74 in Fukushima. Although the ratio is still below 1.0, the employment situation improved in all three prefectures. The number of effective job offers increased 7.7% in Iwate, 1.9% in Miyagi and 6.7% in Fukushima compared with the previous month.²

It is conceivable that many jobs are expected to be created as a result of the implementation of reconstruction projects. Therefore, although a labor supply-demand mismatch may arise in the short term, the overall number of new jobs created is certain to increase. However, there is the question of whether the labor market in the three disaster-stricken prefectures will be restored to the pre-earthquake condition in the long term or if it will undergo structural changes. In some cases, the industrial structure of an area hit by a major exogenous shock such as a natural disaster undergoes significant change. In such cases, there will naturally be changes in the types of available jobs, employment arrangements, and working styles in the relevant labor market. Until now, attention has tended to be put on the short-term impact of natural disasters, including earthquakes, on the labor market. However, it is also important to consider possible long-term structural changes. Otherwise, it would be impossible to draw up a long-term vision of post-disaster reconstruction. This paper examines the impact of the 1995 Great Hanshin-Awaji Earthquake, which inflicted devastating damage as the Great East Japan Earthquake has done, on the labor market of the disaster-affected areas from short-, medium- and long-term perspectives.

There are two reasons why our research takes up the Great Hanshin-Awaji Earthquake as its subject. First, it is possible to examine the long-term impact of that earthquake. The Great Hanshin-Awaji Earthquake occurred on January 17, 1995, inflicting devastating damage in the Hanshin-Awaji region. We believe that the 17 years since the occurrence of the earthquake is a sufficient length of period for us to examine the long-term impact. The second reason is that like the Great East Japan Earthquake, the Great Hanshin-Awaji Earthquake was a natural disaster that destroyed physical and human capital on a huge scale in the disaster areas. Examination of the impact of the Great Hanshin-Awaji Earthquake on the affected areas' labor markets will provide an ideal comparison whereby to forecast structural changes that may occur in the future in the labor market of the three disaster-stricken

² Refer to the following websites. Iwate Labour Bureau: <http://iwate-roudoukyoku.jsite.mhlw.go.jp/var/rev0/0032/4629/201232104215.pdf>. Miyagi Labour Bureau: <http://miyagi-roudoukyoku.jsite.mhlw.go.jp/library/miyagi-roudoukyoku/syokugyousyoukai/ippansyokugyousyoukaijyoukyouH24.1.pdf>. Fukushima Labour Bureau: <http://fukushima-roudoukyoku.jsite.mhlw.go.jp/var/rev0/0032/4821/201232102544.pdf>.

prefectures. Of course, there are significant differences between the Great East Japan Earthquake and the Great Hanshin-Awaji Earthquake in various aspects. First of all, they are earthquakes of different types and scales. In addition, in the case of the Great East Japan Earthquake, the impact was complicated by the subsequent tsunami and nuclear power station accident, which would make a straightforward comparison with the impact of the Great Hanshin-Awaji Earthquake infeasible. Moreover, the disaster areas of these two earthquakes have different industrial characteristics. Whereas the Great Hanshin-Awaji Earthquake inflicted considerable damage to a region where manufacturing and service industries were concentrated, the Great East Japan Earthquake devastated a region where fisheries and agricultural industries were prosperous. As explained above, a straightforward comparison between the impacts of these two earthquakes would not be feasible given their differences in the extent of damage as well as the local characteristics and industrial structures of the disaster areas. However, it is important to examine how the Great Hanshin-Awaji Earthquake changed the labor market structure of the affected areas in the long term, and we expect that the results of the examination will make significant contributions to future studies on how to develop the labor market of the three disaster-stricken prefectures.

This paper uses monthly data of the employment placement services statistics compiled by the Hyogo Labour Bureau. As for the analysis method, we use the ARMA (autoregressive-moving-average) model, which is widely used for time series analysis. As Ewing, Kruse and Thompson (2009) did when they estimated the short- and long-term impacts of another type of natural disaster, a tornado, on the labor market of the disaster areas, we estimate the disaster impact by adding to the ARMA model variables that measure the effects of a shock in the form of a natural disaster.

The summary of the results obtained is as follows. Regarding part-time workers, while the number of new vacancies rose in the short term, the number of new job seekers declined and the number of job placements dropped steeply. As a result of the analysis of the number of new job seekers, it was observed that in many parts of the disaster-stricken region, the number of job placements dropped steeply in the short term, followed by a substantial rebound in the medium term and by a fallback in the long term. This trend was particularly notable in the eastern parts of the disaster-stricken region, including Kobe, Nada, Amagasaki, Nishinomiya and Itami. It is presumed that the decline in the number of part-time job placements after the earthquake resulted from a labor supply shortage.

As for full-time workers, it was empirically observed that the growth in job placements dropped steeply even though growth in the numbers of new vacancies and new job seekers rose or remained flat in the short term compared with the pre-earthquake level. This was presumably due to labor supply-demand mismatch. The values of the coefficients alone seem to suggest that the number of job placements for full-time jobs would recover in the medium term, followed by a decline in the long term, as in the case of part-time jobs. However, we cannot regard that as a definite trend since it is not statistically significant.

This paper is structured as follows. The next section describes previous studies that

analyzed the economic impact of natural disasters, including earthquakes, on the disaster areas. Section III explains the key points of the extent of the damage inflicted by the Great Hanshin-Awaji Earthquake and its economic impact. Section IV explains the data used for our analysis and the estimation method, and Section V reports on the results of the estimation. The final section provides our conclusion.

II. Previous Studies

This section cites research papers that analyzed the economic and social impact of natural disasters. Cavallo and Noy (2011) published a detailed survey paper that summarized previous studies in this field. This section cites some of the research papers which were taken up by Cavallo and Noy (2011) and which are related to the purpose of our research. Studies in this field primarily aim to analyze the factors that determine the extent of damage caused by various natural disasters, including not only earthquakes but also typhoons, tornados, tsunamis and volcanic eruptions, and to estimate their short- and long-term economic impacts on the disaster areas. Data usually used in such studies are cross-country panel data.

First, let us cite papers which examined the short-term impact of natural disasters. Raddatz (2007) and Noy (2009) reported on their studies based on regression of per capita GDP on variables that indicate the scale of natural disasters. Both of them observed that natural disasters produce a negative economic impact on the disaster areas in the short term. Noy (2009) estimated the impact by adding to his analysis interaction terms with the natural disaster variables. As a result, Noy observed that the higher a country's living standards are and the more open and mature it is, the smaller the short-term negative impact of a natural disaster, as well as longer-term spill-over effects, is. To put it another way, the less economically developed a country is, the more serious the impact of a natural disaster is and the longer it takes to complete restoration and reconstruction work.³

However, the findings may vary depending on the estimation method and variables selected. As a result of an estimation using the GMM method, Loayza et al. (2009) observed that a natural disaster of a modest scale might produce a positive economic impact on the disaster area. Meanwhile, Loayza et al. (2009) reported that a large-scale natural disaster produces a negative economic impact in the short term, a finding consistent with the study by Raddatz (2007) and Noy (2009). Loayza et al. (2009) conjectured that a modest-scale natural disaster produces a positive economic impact because the benefits of special demand created by restoration and reconstruction work surpass the losses caused by the disaster damage.

³ Cavallo, Powell, and Becerra (2010) estimated the amount of losses caused by the earthquake that occurred in Haiti on January 12, 2010. They estimated the amount at US\$ 810 million at minimum.

Next, we cite studies that analyzed the long-term impact of natural disasters. As may be expected, some studies reported that a natural disaster produced a negative economic impact in the long term (Noy and Nualsri 2011). Meanwhile, Skidmore and Toya (2002), who estimated the long-term impact using country-specific cross-section data covering 1960-1990, reported that a natural disaster produced a positive economic impact in the long term, contrary to the finding of Noy and Nualsri (2011). Skidmore and Toya (2002) pointed to the effect of “creative destruction” as the reason for the positive impact. The idea is that a natural disaster destroys old, inefficient industries at once and spurs the birth of new industries, resulting in long-term economic growth. Cuaresma, Hlouskova, and Obersteiner (2008) examined the theory of natural disaster-induced creative destruction. Their study showed that economic growth due to creative destruction induced by natural disasters was observed in developed countries but not in developing countries. That is presumably because it is difficult to introduce and spread new technologies in developing countries. Their observation of the differences between developed and developing countries in the short-term economic impact and longer-term spillover effects of natural disasters is consistent with the findings of Noy (2009).

Cavallo et al. (2010) used a new method in estimating the long-term impact of natural disasters. Using the comparative event study, they showed the counterfactual economic growth curve that would have been followed in the absence of a natural disaster. They quantified the natural disaster impact on economic growth in terms of the difference between the actual economic growth path and the estimated counterfactual growth path. They reported that the long-term impact of natural disasters on economic growth is not very large.

A study by Ewing, Kruse, and Thompson (2009) is useful as a reference for our examination of the impact of a one-time shock caused by the Great Hanshin-Awaji Earthquake based on time-sequential data. They examined the short- and long-term impact of one-time shocks caused by tornados based on time-sequential data. They found that the labor market improved in the long term in the whole of the disaster areas and in most individual industries. As for our analysis method, which derives from Ewing, Kruse, and Thompson (2009), we will provide detailed explanations later.

III. Great Hanshin-Awaji Earthquake

This section provides an overview of the scale of the Great Hanshin-Awaji Earthquake, the extent of damage inflicted by it and post-earthquake reconstruction measures. At 5:46 a.m. on January 17, 1995, the magnitude 7.3 earthquake occurred with the area in the northern part of Awaji Island as its epicenter. The whole of the fault line that extends from Awaji Island to Mt. Rokko was displaced, causing particularly strong tremors in the areas located along the line. The most severely damaged region comprises the following 10 cities and 10 towns in Hyogo Prefecture: Sumoto City, Tsuna Town, Awaji Town, Hokudan Town,

Ichinomiya Town, Goshiki Town, Higashiura Town, Midori Town, Seidan Town, Mihara Town and Nandan Town in Awaji Island; Kobe City (damage was particularly severe in Suma, Hyogo, Nagata, Nada and Higashi-Nada Wards); Amagasaki City; Itami City; Nishinomiya City; Ashiya City; Takarazuka City; Kawanishi City; Akashi City; and Miki City. Outside of Hyogo Prefecture, a seismic intensity of 4 on the Japanese scale was recorded in Toyonaka City, Osaka Prefecture. According to the status of damage as finalized by the Fire and Disaster Management Agency (FDMA) on May 19, 2006, 6,434 people were killed and three persons remained missing, while 104,906 houses (accommodating 186,175 households) were totally destroyed, 144,274 houses (accommodating 274,182 households) were partially destroyed and 269 fires occurred.⁴

Moreover, much of the infrastructure was destroyed. According to the FDMA's report, 1,579 public buildings, 7,245 sections of road and 330 bridges were damaged. Broadcast footage of a toppled section of the Hanshin Expressway's Kobe line shocked viewers. The Kobe lines of the railways operated by West Japan Railways and private railway companies (Hanshin, Hankyu and Sanyo), as well as the facilities of municipal subway and bus operators, were also considerably damaged, bringing traffic in the region to a standstill. The lifeline infrastructure also sustained significant damage. According to a report issued by the Hyogo Prefectural government in December 2011, approximately 2.6 million households were cut off from electricity supply, approximately 845,000 households from gas supply and approximately 1.27 million houses from running water. Approximately 478,000 telephone lines, including exchange and subscriber lines, went out of service. These lifeline services were mostly restored by April 1995 at the latest.⁵ On the man-made Port Island, many condominium buildings were damaged due to soil liquefaction. The port operations at Kobe Port were considerably disrupted. According to the table of changes in the value of annual trade going through Kobe Port compiled by Kobe Customs, trade via Kobe Port accounted for around 10% of Japan's overall trade, including both imports and exports, in the pre-earthquake period. Immediately after the earthquake, Kobe Port's share declined to 5.9%, and it has never recovered to the pre-earthquake level since then. In 2010, the share was 5.9%.⁶ Kobe's status as a trading hub city has remained damaged since the earthquake. This is evidence that the Great Hanshin-Awaji Earthquake significantly affected the industrial structure of the disaster areas. As a result of a decline in the volume of trade handled at Kobe Port, the number of workers engaging in trade and port-related jobs declined, with other industries absorbing workers made redundant.

⁴ Refer to the website of the Hyogo prefectural government: http://web.pref.hyogo.jp/pa20/pa20_00000015.html.

⁵ "On the status of Restoration and Reconstruction after the Great Hanshin-Awaji Earthquake" by the Hyogo prefectural government, December 2011. <http://web.pref.hyogo.jp/wd33/documents/fukkyu-fukko2012-12.pdf>.

⁶ Refer to the table of changes in the value of annual trade going through Kobe Port at the following website of Kobe Customs: <http://web.pref.hyogo.jp/wd33/documents/fukkyu-fukko2012-12.pdf>.

Next, we explain the economic losses caused by the Great Hanshin-Awaji Earthquake. According to an estimate by the Hyogo prefectural government (April 5, 2005), the total amount of losses came to ¥9,926.8 billion, of which losses from building destruction accounted for the largest portion, ¥5,800 billion. It should be noted that the losses as estimated by the Hyogo prefectural government cover only direct losses. Uenoyama and Arai (2007) explained the calculation method of the losses in detail. Toyoda and Kochi (1997) calculated the amount of economic losses, including both direct and indirect losses, caused by the earthquake. The indirect losses as defined by them are financial losses arising from the loss of commercial opportunities suffered by persons and companies as a result of the damage they sustained themselves or by their business partners. Toyoda and Kochi also estimated the amount of losses broken down by industry. According to their estimate, losses amounted to ¥2.9 trillion in the “wholesale/retail industries,” ¥2 trillion in the “services/other industries” and ¥1.2 trillion in the “manufacturing industry.” These figures reflect the high concentration of manufacturing and services industries in the Hanshin-Awaji region.

On November 30, 1998, the investigative committee on the Great Hanshin-Awaji Earthquake reported on its estimate of the indirect losses. This report paid attention to opportunity losses caused to industries by disruptions of freight transport due to the damage done to roads and port facilities. The committee estimated the amount of losses over the two-year period from February 1995, the month following the earthquake, to January 1997 at ¥1,828.8 billion. Broken down by industry, estimated losses amounted to ¥1,375 billion in the “manufacturing industry,” ¥319 billion in the “wholesale industry,” ¥84.2 billion in the “retail industry” and ¥51 billion in the “port-related industries.” The committee also estimated the amount of losses based on the results of a survey conducted on companies in March 1995. The estimated losses totaled ¥50.2 billion. Uenoyama and Arai (2007) compiled a detailed summary of the results of various estimates of the economic losses caused by the Great Hanshin-Awaji Earthquake.

Next, we provide a brief overview of the reconstruction measures taken after the Great Hanshin-Awaji Earthquake and the effects thereof. In July 1995, the Great Hanshin-Awaji Earthquake Reconstruction Plan (Hyogo Phoenix Plan) was formulated with a view to not merely restoring the disaster areas to the pre-earthquake condition but creating a new, mature society. The plan set the goal of rebuilding the most severely damaged 10 cities and 10 towns by 2005 to make them highly disaster-resilient, create a cosmopolitan culture and strengthen welfare services. In fields that require quick reconstruction, such as infrastructure, housing and industry, emergency three-year reconstruction plans were formulated in August and November 1995. The goals under these emergency reconstruction plans were achieved on the whole by 1998, the final year of the plans. Thereafter, various reconstruction plans were drawn up and carried out, resulting in steady progress in post-earthquake restoration and reconstruction. Under the Three-Year Policy for Utilizing Results of Reconstruction Work for Prefectural Administration, which was formulated in February 2007, the emphasis started to shift from reconstruction in the disaster areas to

passing the experiences and lessons of the Great Hanshin-Awaji Earthquake on to future generations.

Have the various reconstruction measures been effective in achieving post-earthquake reconstruction in the Hanshin-Awaji region? The damage done by the earthquake forced a large number of people to live away from their homes. Some people were temporarily evacuated and others left the region for good. According to “On the Status of Restoration and Reconstruction after the Great Hanshin-Awaji Earthquake” a report compiled by the Hyogo prefectural government, the population in Hyogo Prefecture was estimated at approximately 3.59 million as of January 1, 1995. The national census showed that the population in Kobe was down steeply to approximately 3.44 million as of October 1 of the same year. However, the population gradually rebounded later due to an increase in immigration from other parts of the country to stand at approximately 3.58 million, almost reaching the pre-earthquake level. Since then, the population has continued to grow, standing at 3.67 million as of October 1, 2010. The introduction of a housing rent subsidy scheme for young married couples has presumably led to the increase in immigration into the former disaster areas.

According to the Hyogo prefectural government’s “On the Status of Restoration and Reconstruction after the Great Hanshin-Awaji Earthquake,” real gross product in the disaster areas was higher in the three-year period from 1995, the year of the earthquake, to 1997 than in the pre-earthquake period because of special demand related to reconstruction work. However, real gross product later declined and remained below the pre-earthquake level as reconstruction-related demand disappeared and the entire Japanese economy weakened. Since 2004, gross product in the disaster areas rebounded in line with the recovery of Japan’s gross domestic product due to improved economic conditions.

The post-earthquake industrial recovery policy comprised three pillars. The first pillar was support for earthquake-damaged small and medium-size enterprises (SMEs). The second pillar was the development of new industries and growth industries. The third pillar was the establishment of a special economic zone. This policy indicated eagerness to develop new industries by inviting various venture companies, instead of relying on existing companies alone. According to the Establishment and Enterprises Census (Ministry of Internal Affairs and Communications), the average business start-up ratio in the disaster areas in 1996 through 2006 was 5.5%, significantly higher than the national average of 4.3%.

The effective ratio of job offers to seekers in the disaster areas moved in line with the gross product there. In other words, the effective ratio of job offers to seekers rose immediately after the earthquake due to reconstruction-related demand. However, the ratio remained below 1.0, meaning a continued shortage of job vacancies in the affected areas. After reconstruction-related demand disappeared, the effective ratio of job offers to seekers declined in line with the weakness of the entire Japanese economy. It later rebounded in

tandem with the recovery of the entire Japanese economy.⁷

Ohata (2011) also analyzed the impact of the Great East Japan Earthquake on employment in light of the impact of the Great Hanshin-Awaji Earthquake. Ohata's study showed that between 1992 and 1997, the number of regular workers declined in Kobe City, while the number of part-time and *arubaito* workers increased.⁸ However, the number of regular workers in Kobe City had already been declining since the collapse of the economic bubble in the early 1990s, and the downtrend continued until 2002 (Ohata 2001, Figure 19). Ohata's findings do not necessarily mean that the Great Hanshin-Awaji Earthquake caused the decline in the number of regular employees. The number of non-regular workers has been increasing since 1982, regardless of the impact of the earthquake. A similar trend is observed in nationwide data on the number of non-regular workers. The increase in the number of part-time and *arubaito* workers is notable among younger men (15 to 39 years old).

Horwich (2000) gave high marks to the reconstruction after the Great Hanshin-Awaji Earthquake and also commented on disaster prevention/mitigation measures that should be taken by administrative organizations and private-sector companies based on the lessons of the earthquake. Horwich (2000) praised the faster-than-expected pace of the reconstruction and attributed it to the relatively small amount of capital resource losses compared with physical resource losses. While expressing his appreciation of administrative organizations' quick moves to restore the lifeline infrastructure and provide relief goods, he also cited points to be improved. One of the points was the failure of coordination with relevant people and organizations, as represented by a lack of cooperation with volunteers and the mismatch between disaster victims' needs and the supply of relief goods. It is necessary to enhance the mediation function of administrative organizations and develop a system that enables efficient provision of relief goods and allocation of volunteers. Moreover, Horwich observed that it is essential for the private sector to cooperate in enhancing the disaster prevention/mitigation functions, rather than leaving that task entirely to administrative organizations.

IV. Data and Model Specification

This section explains the data and estimation method used in our research. As our research examines how the Great Hanshin-Awaji Earthquake affected the labor market structure in the disaster areas in the long term, we use the job placement services statistics concerning the areas over a long period of time. With cooperation from the Hyogo Labour Bu-

⁷ A graph indicating changes in the effective ratio of job offers to seekers is included in "On the Status of Restoration and Reconstruction after the Great Hanshin-Awaji Earthquake" by the Hyogo prefectural government. <http://web.pref.hyogo.jp/wd33/documents/fukkyu-fukko2012-12.pdf>.

⁸ Refer to Figure 18, Ohata (2011). This figure is based on the Employment Status Survey compiled by the Ministry of Internal Affairs and Communications.

reau, we collected monthly data that covers the period from April 1993 to March 2009.

Among variables related to the job placement services statistics, we paid particular attention to the numbers of new job seekers, new vacancies and job placements. All of these numbers are presumed to have declined immediately after the earthquake as the labor market was severely damaged. In contrast, it may be presumed that the number of vacancies in the construction sector increased rapidly during the post-earthquake reconstruction period. However, if job seekers were not willing to work in the construction sector, a labor supply-demand mismatch would arise, limiting the rise in the number of job placements. If reconstruction-related demand disappears and the initial negative impact of the earthquake produce spillover effects, the numbers of new job seekers, vacancies and job placements would remain lower than the pre-earthquake level. Or, as observed by Cavallo, Galiani, Noy and Pantano (2010), the impact of the earthquake may not be significant in the long term.

Moreover, our analysis looks at full-time workers and part-time workers separately. In the job placement services statistics, full-time work is defined as including both permanent and extraordinary/seasonal work. The part-time worker refers to a worker whose weekly working hours are shorter than the weekly working hours of regular workers employed by the same employer. Of part-time workers, those who work under a non-fixed-term contract or under a contract of four months or longer are defined as “permanent part-time workers” and those who work under a fixed-term contract, under a contract of one to three months or under a seasonal fixed-term contract are defined as “temporary part-time workers.”⁹

Analysis that looks at full-time workers and part-time workers separately enables us to indirectly examine how the Great Hanshin-Awaji Earthquake affected the industrial structure of the disaster areas in the long term. Roughly speaking, more full-time workers work in the manufacturing and trade/port-related industries than part-time workers, while the opposite is true in the retail and service industries. By comparing changes in the number of new vacancies broken down by full-time and part-time workers in the post-earthquake period, we can indirectly grasp the changes undergone by the industrial structure in the disaster areas. If the number of new vacancies for part-time workers increased more than the number of vacancies for full-time workers, that would mean that the center of gravity of the industrial structure shifted from the manufacturing and trade/port-related industries, which constituted the industrial core of the Hanshin-Awaji region before the earthquake, to the retail and service industries after the disaster. As in the case of the findings of Ohata (2011), given that the ratio of part-time workers has been rising on a nationwide basis since the 1990s, we must naturally keep in mind that the rise in the number of job vacancies for part-time workers cannot be attributed to the impact of the earthquake alone.

In 1995, when the Great Hanshin-Awaji Earthquake occurred, the Hyogo Labour Bureau was providing job mediation service at 18 “Hello Work” offices (Public Employment

⁹ Refer to “Employment Placement Services Statistics” (Ministry of Health, Labour and Welfare) in the “Glossary” (in Japanese). <http://www.mhlw.go.jp/toukei/itiran/roudou/koyou/ippan/detail/01.html>.

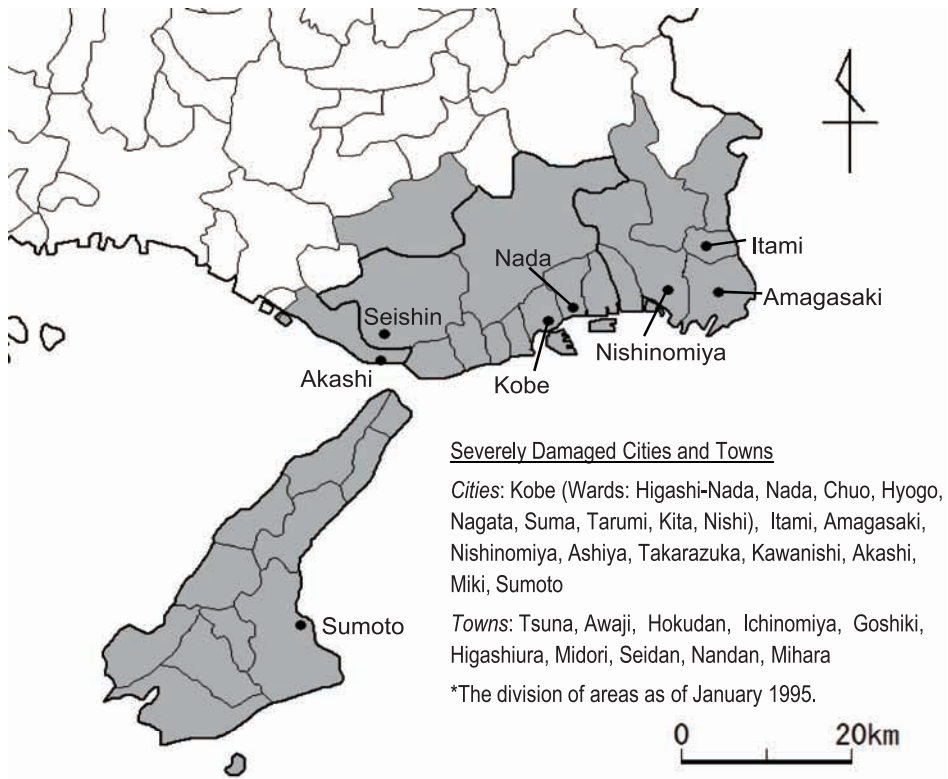


Figure 1. The Most Severely Damaged 10 Cities and 10 Towns and the Locations of Hello Work Offices

Security Offices). In 1995, Hello Work offices in Hyogo Prefecture were located in Kobe (there were three offices in Kobe—the Kobe office, the Seishin office and the Kobe Ladies office), Nada, Amagasaki, Nishinomiya, Himeji (two offices—the Himeji office and the Himeji-Minami office), Kakogawa, Itami, Akashi, Toyooka, Nishiwaki, Sumoto (Awaji Island), Kashiwabara, Tatsuno, Aioi and Yoka). By March 2009, three offices—Himeji-Minami, Aioi and Yoka—were closed, with their operations absorbed by other offices. The Kobe Ladies office, located in Kobe’s Sannomiya area, was transformed into a facility that supported mothers seeking jobs (Mothers Hello Work Sannomiya). In addition, a new office focusing on support for young job seekers (Young Work Plaza Sannomiya) was opened in the Sannomiya area. As our study concentrates on the labor market in the disaster areas, it covers only the Hello Work offices there. The eight offices covered are Kobe, Nada, Amagasaki, Nishinomiya, Itami, Akashi, Sumoto (Awaji Island) and Seishin. As data concerning Kobe Ladies (Mothers Hello Work Sannomiya) and Young Work Plaza Sannomiya were not available, we excluded these two offices from our analysis. Data concerning new graduates were also excluded from our analysis. The eight Hello Work offices covered by the analysis are scattered across the disaster areas as shown in Figure 1. The gray-shaded areas represent

the most severely damaged 10 cities and 10 towns. It should be noted that the Akashi, Sumoto and Seishin offices are located in the western part of the disaster-ravaged region.

The numbers of new job seekers, vacancies and placements are monthly data and may be affected by seasonal factors, so we use year-on-year growth figures for our analysis, as Ewing, Kruse, and Thompson (2009) did. As we calculated year-on-year growth rates based on monthly data for the period between April 1993 and March 2009, the number of observations is 180 in each case. Times series data were obtained from the Hello Work offices in Kobe, Nada, Amagasaki, Nishinomiya, Itami, Akashi, Sumoto and Seishin. Basic statistics regarding growth rates for part-time and full-time workers who obtained jobs through these eight Hello Work offices are as shown in Table 1.

This paper measures the impact of the Great Hanshin-Awaji Earthquake, which occurred in January 1995, by estimating the ARMA model using time series data such as the growth rates of the numbers of new job seekers, vacancies and placements. This method is based on the study by Ewing, Kruse, and Thompson (2009). Ewing, Kruse, and Thompson (2009) conducted analysis while taking account of the possibility of a natural disaster producing a negative impact in the short term, to be followed by a positive impact in the long term. In our study, we examine each of the short-, medium-, and long-term impacts because the data used covers a fairly long period of time, from April 1993 and March 2009. The impact variables are defined as below.

$$\pi_t^s = \begin{cases} 1, & \text{January 1995} \leq t \leq \text{December 1995} \\ 0, & \text{Other} \end{cases} \quad (1)$$

$$\pi_t^m = \begin{cases} 1, & \text{January 1996} \leq t \leq \text{December 1999} \\ 0, & \text{Other} \end{cases} \quad (2)$$

$$\pi_t^l = \begin{cases} 1, & t \geq \text{January 2000} \\ 0, & t < \text{January 2000} \end{cases} \quad (3)$$

π_t^s represents a dummy variable used to measure the short-term impact during the one-year period from the occurrence of the earthquake, while π_t^m represents a dummy variable used to measure the medium term impact between the second and fifth years from the earthquake. π_t^l represents a dummy variable use to measure the long-term impact in the period since the sixth year from the earthquake. The ARMA model incorporating these impact variables is as shown below.

$$\phi(L)g_t = \theta(L)\varepsilon_t + c_0 + \phi I_t + \lambda^s \pi_t^s + \lambda^m \pi_t^m + \lambda^l \pi_t^l \quad (4)$$

g_t represents the growth rates of the numbers of new job seekers, vacancies and placements. I_t represents the growth rate of the industrial production index (production)

Table 1. Basic Statistics (Year-on-Year Changes)

	Mean	Standard deviation	Minimum	Maximum
<u>Number of job placements</u>				
Part-time				
Kobe	0.0928	0.2504	-0.5333	1.0462
Nada	0.1506	0.359	-0.6522	2.1579
Amagasaki	0.0555	0.2077	-0.4353	0.8364
Nishinomiya	0.136	0.3235	-0.5909	2.25
Itami	0.1017	0.2501	-0.3538	0.8974
Akashi	0.0636	0.2083	-0.3631	1.1067
Sumoto	0.2294	0.6042	-0.7778	5.0000
Seishin	0.1685	0.4561	-0.5588	3.3846
Full-time				
Kobe	0.0383	0.2366	-0.5881	1.0412
Nada	0.0571	0.2826	-0.4842	1.2169
Amagasaki	0.0515	0.2331	-0.4167	0.8926
Nishinomiya	0.075	0.2321	-0.4493	0.9605
Itami	0.0673	0.2419	-0.3786	0.9219
Akashi	0.054	0.2217	-0.3401	0.8326
Sumoto	0.0591	0.2584	-0.4352	0.7895
Seishin	0.1228	0.3113	-0.3542	1.6111
<u>Number of new job vacancies</u>				
Part-time				
Kobe	0.1188	0.2479	-0.2715	1.1334
Nada	0.1536	0.3489	-0.5513	2.2139
Amagasaki	0.09	0.2577	-0.4204	1.5717
Nishinomiya	0.136	0.3265	-0.4884	1.8035
Itami	0.1142	0.3147	-0.603	1.7465
Akashi	0.106	0.3037	-0.4755	1.5881
Sumoto	0.1425	0.4772	-0.7877	2.7568
Seishin	0.16	0.3993	-0.6528	1.8438
Full-time				
Kobe	0.0809	0.3339	-0.5049	1.1987
Nada	0.114	0.3816	-0.5158	1.9946
Amagasaki	0.0592	0.3229	-0.4763	1.5201
Nishinomiya	0.0701	0.3706	-0.489	1.5277
Itami	0.066	0.3493	-0.6437	1.2105
Akashi	0.0648	0.3479	-0.4894	1.6142
Sumoto	0.0396	0.3977	-0.5395	1.7623
Seishin	0.1487	0.5471	-0.5631	2.0775

Table 1 (*Continued*)

	Mean	Standard deviation	Minimum	Maximum
<u>Number of new job seekers</u>				
Part-time				
Kobe	0.0587	0.194	-0.4771	0.6694
Nada	0.2079	0.5427	-0.6471	3.1333
Amagasaki	0.0643	0.2108	-0.4177	0.7532
Nishinomiya	0.1511	0.3886	-0.4079	2.1333
Itami	0.0405	0.1473	-0.3043	0.4079
Akashi	0.0435	0.1791	-0.4186	0.938
Sumoto	0.2076	0.4381	-0.5098	2.5385
Seishin	0.1068	0.2571	-0.4018	1.5455
Full-time				
Kobe	0.0251	0.2131	-0.6142	1.3803
Nada	0.0254	0.2394	-0.7054	1.5708
Amagasaki	0.01	0.1575	-0.386	0.4236
Nishinomiya	0.0215	0.1697	-0.3956	0.5988
Itami	0.0269	0.1938	-0.5203	0.505
Akashi	0.032	0.2022	-0.4929	1.2868
Sumoto	0.0498	0.2235	-0.6011	1.6985
Seishin	0.0576	0.2244	-0.4323	1.8009
Industrial production index	-0.0008	0.062	-0.2932	0.1119

for the Kinki region,¹⁰ which is used to control economic cyclical fluctuations, and ϕ represents its coefficient. λ^s, λ^m and λ^l represent the coefficients of dummy variables π_t^s (short term), π_t^m (medium term) and π_t^l (long term), respectively. ε_t represents an error term. $\phi(L)$ and $\theta(L)$, which represent polynomials of the lag operator L , include the coefficients of the degree p of the AR term and the degree q of the MA term. We estimate this model using time series data such as the numbers of new job seekers, vacancies and placements regarding full-time and part-time workers who obtained jobs in Hello Work offices in Kobe, Nada, Amagasaki, Nishinomiya, Itami, Akashi, Sumoto and Seishin. When selecting the degree p of the AR term and degree q of the MA term, we made the selection based on BIC (Bayesian information criterion) after checking auto correlation and partial auto correlation regarding each series.

V. Estimation Result

This section presents the results of the estimation of equation (4) in the previous section using the numbers of new job seekers, vacancies and placements regarding full-time and part-time workers.

First, let us look at the number of job placements for part-time workers in Table 2.

¹⁰ Raw numbers were obtained from the Kinki Bureau of Economy, Trade and Industry. Regarding the period before December 2002, connected index data were used.

The coefficient of the short-term dummy variable concerning Kobe was -0.7402 and was significant at the 1% level. This means that during the one-year period from the occurrence of the earthquake, the year-on-year growth rate of job placements dropped by 74.02 percentage points compared with the previous year. The coefficient of the medium-term dummy variable was -0.2025 and was not significant, while the coefficient of the long-term dummy variable was -0.3461 and was significant at the 5% level. This means that the growth rate declined by around 20.25 percentage points or recovered close to the pre-earthquake level during the second to fifth years from the earthquake compared with the pre-earthquake level, before falling back by as much as 34.61 percentage points in the long term. However, the long-term fall was not as steep as the decline that immediately followed the earthquake. When interpreting these results, we must keep in mind that the pre-earthquake data cover a fairly short period of time, from April 1994 to December of the same year. The constant term 0.4243 indicates a very high growth rate of the number of job placements during that period. Therefore, although the growth turned negative in the short term, it remained positive in the long term, despite dropping by 34.61 percentage points from 42.43%.

Not only in Kobe but also in Nada, Amagasaki, Nishinomiya and Itami, the growth rate declined steeply in the short term, followed by a substantial recovery in the medium term and a fallback in the long term. These five cities are located in the eastern part of the region comprised of the 10 cities and 10 towns mostly severely damaged (Figure 1). The coefficient of the short-term dummy variable concerning Seishin was negative, while a statistically significant decline was not observed in the short term in either of Akashi, Sumoto or Seishin. The coefficient of the long-term dummy variable concerning Seishin was significantly negative at a 10% level of significance. This suggests that the employment situation differed from area to area within the region according to the damage status and the industrial structure.

The coefficient of changes in the industrial production index, which indicates the economic condition across a broad area, was positive with regard to some areas and negative with regard to others. That is presumably because of area-to-area differences in labor supply and demand, both of which are reflected in the number of job placements.

The estimation results concerning the number of new vacancies for part-time workers are as shown in Table 3. The coefficient of changes in the industrial production index was positive with regard to all areas. The coefficient of the short-term dummy variable was positive with regard to all areas except for Itami. The coefficient was statistically significant with regard to Kobe (0.2555), Nada (0.6401), Nishinomiya (0.4324), Akashi (0.4207) and Sumoto (0.5905). The very high values of the coefficients regarding these areas indicate that the number of new vacancies for part-time workers increased steeply in the short term. We did not observe any notable trend regarding the medium- and long-term impact. Thus, while demand for part-time workers grew in the short term, that did not lead to an increase in the number of job placements.

Table 2. Estimation Results Concerning the Number of Job Placements for Part-Time Workers

	Kobe	Nada	Amagasaki	Nishinomiya	Itami	Akashi	Sumoto	Seishin
Industrial production index	1.0984 ** (0.461)	0.1686 (0.632)	-0.5942 ** (0.278)	0.0122 (0.658)	0.5446 (0.378)	-0.2305 (0.291)	-0.2157 (0.887)	-0.2317 (0.892)
Short-term	-0.7402 *** (0.104)	-0.4643 *** (0.159)	-0.4210 *** (0.075)	-0.4520 * (0.233)	-0.6467 *** (0.149)	0.0178 (0.107)	0.1052 (0.450)	-0.1728 (0.263)
Medium-term	-0.2025 (0.124)	-0.0950 (0.134)	-0.1853 *** (0.056)	-0.0869 (0.164)	-0.2593 * (0.140)	0.0031 (0.135)	0.3708 (0.456)	-0.2672 (0.202)
Long-term	-0.3461 ** (0.154)	-0.3184 ** (0.148)	-0.3364 *** (0.050)	-0.2465 (0.155)	-0.4300 *** (0.136)	-0.1023 (0.144)	0.0819 (0.458)	-0.3615 * (0.193)
Constant term	0.4243 *** (0.139)	0.4079 *** (0.126)	0.3399 *** (0.045)	0.3424 ** (0.143)	0.4817 *** (0.132)	0.1262 (0.136)	0.0734 (0.443)	0.4793 ** (0.194)
Degree of AR term	3	2	2	2	2	3	2	2
Degree of MA term	0	2	1	0	0	2	2	2
Log likelihood	58.72	-47.94	61.87	-23.30	34.56	52.00	-153.7	-94.68
Observations	180	180	180	180	180	180	180	180

Note: The figures in parentheses indicate the values of standard errors. *** Significant at 1%. ** Significant at 5%. * Significant at 10%.

Table 3. Estimation Results Concerning the Number of New Job Vacancies for Part-Time Workers

	Kobe	Nada	Amagasaki	Nishinomiya	Itami	Akashi	Sumoto	Seishin
Industrial production index	0.9033 *** (0.344)	0.4847 (0.542)	0.8734 ** (0.378)	0.1219 (0.677)	0.7851 (0.503)	1.2051 *** (0.417)	0.7333 (0.841)	0.8643 (0.656)
Short-term	0.2555 *** (0.059)	0.6401 *** (0.112)	0.0827 (0.122)	0.4324 *** (0.116)	-0.0470 (0.124)	0.4207 *** (0.097)	0.5905 ** (0.258)	0.1119 (0.177)
Medium-term	-0.1141 (0.113)	0.1419 (0.112)	-0.0081 (0.108)	0.3142 *** (0.112)	-0.1928 * (0.109)	-0.0834 (0.090)	0.3198 (0.290)	-0.1895 (0.151)
Long-term	0.0328 (0.129)	0.0849 (0.111)	-0.0681 (0.104)	-0.0532 (0.139)	-0.2276 ** (0.102)	-0.0785 (0.087)	0.3283 (0.294)	-0.1504 (0.159)
Constant term	0.1055 (0.119)	0.0212 (0.103)	0.1294 (0.102)	0.0612 (0.116)	0.3096 *** (0.096)	0.1496 * (0.081)	-0.1838 (0.289)	0.3012 ** (0.147)
Degree of AR term	7	0	0	2	1	0	0	2
Degree of MA term	2	0	0	3	1	0	3	2
Log likelihood	48.51	-48.50	-3.799	-23.89	-31.72	-15.61	-90.90	-62.95
Observations	180	180	180	180	180	180	180	180

Note: The figures in parentheses indicate the values of standard errors. *** Significant at 1%. ** Significant at 5%. * Significant at 10%.

Table 4 shows the estimation results concerning the number of new job seekers among part-time workers. The coefficient of changes in the industrial production index was positive with regard to some areas and negative with regard to others. The coefficient of the short-term dummy variable was negative with regard to all areas. The absolute values of the coefficients regarding Kobe (-0.4689), Nada (-0.2266), Amagasaki (-0.3449), Nishinomiya (-0.5031) and Itami (-0.2681) were high, indicating a steep drop in the supply of part-time workers in these areas. However, the absolute values of the coefficients regarding Akashi (-0.0800), Sumoto (-0.0330) and Seishin (-0.1614) were relatively low, indicating a modest decline in the supply in these areas. Presumably, that is why the number of job placements declined steeply in Kobe, Nada, Amagasaki, Nishinomiya and Itami but did not drop in Akashi, Sumoto and Seishin. In many areas, the number of new job seekers declined steeply in the short term, followed by a substantial recovery in the medium term and a fallback in the long term, as the number of job placements did.

Table 5 shows the estimation results concerning the number of job placements for full-time workers. The coefficient of changes in the industrial production index was positive with regard to all areas. The coefficient of the short-term dummy variable was negative with regard to all areas. The coefficient was statistically significant with regard to Kobe (-0.5444), Amagasaki (-0.3904), Nishinomiya (-0.5420), Itami (-0.3138) and Seishin (-0.4485), indicating that the number of job placements dropped sharply in the short term in these areas. While the coefficient regarding Nada was not statistically significant, its value, at -0.5166, was high. The number of job placements is presumed not to have declined much in Akashi and Sumoto as in the case of the estimation regarding part-time workers. Regarding areas other than Seishin, the coefficients of the medium- and long-term dummy variables were not significant. Therefore, it is presumed that although the number of job placements for full-time workers dropped in the short term, it recovered to the pre-earthquake level in the medium and long term. If we look at the values of the coefficients with no regard for their statistical significance, we can observe a pattern similar to the one in the case of part-time workers—a steep drop in the short-term followed by a substantial recovery in the medium term and a fallback in the long term. Regarding Seishin, the coefficients of the short-, medium- and long-term dummy variables were -0.4485, -0.3679 and -0.4435, respectively, indicating that the number of job placements dropped very steeply in the medium and long terms compared with the pre-earthquake level. However, the possibility cannot be denied that the reason for that was because the pre-earthquake growth rate, as indicated by the constant term 0.5253, was too high.

Table 6 shows the estimation results concerning the number of new vacancies for full-time workers. The coefficient of changes in the industrial production index was positive with regard to all areas except for Sumoto. The coefficient of the short-term dummy variable was positive with regard to all areas except for Itami. The coefficient was statistically significant with regard to Nada (0.3235), Amagasaki (0.3735), Akashi (0.6915) and Seishin (1.1495). The value of the coefficient in each of these areas was very high, indicating that

Table 4. Estimation Results Concerning the Number of New Job Seekers among Part-Time Workers

	Kobe	Nada	Amagasaki	Nishinomiya	Itami	Akashi	Sumoto	Seishin
Industrial production index	0.7378 *** (0.177)	1.7774 (1.109)	0.3568 (0.339)	0.7374 (0.828)	-0.3139 ** (0.157)	-0.2475 (0.305)	-0.3425 (0.848)	-0.1188 (0.338)
Short-term	-0.4689 *** (0.095)	-0.2266 (0.488)	-0.3449 *** (0.132)	-0.5031 (0.370)	-0.2681 *** (0.062)	-0.0800 (0.073)	-0.0330 (0.420)	-0.1614 ** (0.077)
Medium-term	-0.0375 (0.070)	0.2764 (0.655)	-0.3064 ** (0.128)	0.1325 (0.323)	-0.1055 * (0.059)	0.0307 (0.063)	0.2585 (0.352)	-0.3956 *** (0.068)
Long-term	-0.1372 * (0.074)	0.0719 (0.565)	-0.3655 *** (0.107)	-0.2766 (0.326)	-0.2188 *** (0.058)	-0.0963 * (0.054)	0.2889 (0.346)	-0.4025 *** (0.062)
Constant term	0.1833 *** (0.069)	0.1543 (0.557)	0.3996 *** (0.090)	0.3256 (0.312)	0.2230 *** (0.056)	0.0940 * (0.055)	-0.0390 (0.338)	0.4684 *** (0.062)
Degree of AR term	2	5	1	1	4	2	1	2
Degree of MA term	2	1	1	0	3	3	0	4
Log likelihood	152.4	-73.83	78.67	9.691	135.6	98.46	-81.02	43.07
Observations	180	180	180	180	180	180	180	180

Note: The figures in parentheses indicate the values of standard errors. *** Significant at 1%. ** Significant at 5%. * Significant at 10%.

Table 5. Estimation Results Concerning the Number of Job Placements for Full-Time Workers

	Kobe	Nada	Amagasaki	Nishinomiya	Itami	Akashi	Sumoto	Seishin
Industrial production index	1.3139 *** (0.362)	0.9307 * (0.557)	1.2702 *** (0.360)	0.9186 ** (0.404)	0.7289 (0.474)	1.5586 *** (0.418)	0.3541 (0.391)	1.4466 *** (0.489)
Short-term	-0.5444 ** (0.242)	-0.5166 (0.350)	-0.3904 *** (0.144)	-0.5420 *** (0.182)	-0.3138 ** (0.141)	-0.1104 (0.146)	-0.0806 (0.147)	-0.4485 *** (0.165)
Medium-term	0.1009 (0.249)	-0.0760 (0.328)	-0.1617 (0.163)	-0.0920 (0.184)	-0.0899 (0.139)	-0.0585 (0.163)	0.1498 (0.159)	-0.3679 ** (0.148)
Long-term	0.0646 (0.259)	-0.1312 (0.327)	-0.2147 (0.142)	-0.1045 (0.216)	-0.1712 (0.153)	-0.0813 (0.146)	0.0533 (0.172)	-0.4435 *** (0.135)
Constant term	0.0166 (0.260)	0.1952 (0.319)	0.2521* (0.145)	0.2062 (0.208)	0.2234 * (0.135)	0.1303 (0.149)	-0.0043 (0.159)	0.5253 *** (0.136)
Degree of AR term	2	2	2	4	1	4	2	5
Degree of MA term	0	0	2	2	1	1	0	1
Log likelihood	77.56	3.875	78.27	64.38	45.59	63.06	24.24	11.62
Observations	180	180	180	180	180	180	180	180

Note: The figures in parentheses indicate the values of standard errors. *** Significant at 1%. ** Significant at 5%. * Significant at 10%.

Table 6. Estimation Results Concerning the Number of New Vacancies for Full-Time Workers

	Kobe	Nada	Amagasaki	Nishinomiya	Itami	Akashi	Sumoto	Seishin
Industrial production index	1.5577 ** (0.627)	0.8005 (0.765)	0.0022 (0.632)	0.4663 (0.614)	0.1618 (0.605)	0.0183 (0.517)	-0.7916 (0.724)	1.3341 (1.040)
Short-term	0.0521 (0.114)	0.3253 ** (0.148)	0.3735 *** (0.078)	0.2534 (0.172)	-0.0311 (0.200)	0.6915 *** (0.102)	0.2785 (0.183)	1.1495 *** (0.193)
Medium-term	-0.0591 (0.159)	0.3585 * (0.209)	0.3365 ** (0.141)	0.1571 (0.324)	-0.0574 (0.312)	0.2364 (0.218)	-0.0214 (0.281)	0.6696 ** (0.303)
Long-term	-0.0627 (0.205)	0.2937 (0.313)	0.2973 * (0.159)	0.0612 (0.378)	-0.0886 (0.369)	0.2572 (0.193)	0.0973 (0.256)	0.6044 (0.395)
Constant term	0.1293 (0.194)	-0.1818 (0.295)	-0.2311 (0.142)	-0.0219 (0.345)	0.1322 (0.353)	-0.1877 (0.187)	-0.0067 (0.251)	-0.4688 (0.368)
Degree of AR term	3	3	4	1	1	6	4	1
Degree of MA term	2	0	1	1	3	3	1	2
Log likelihood	21.58	-33.35	17.00	-5.972	0.234	24.21	-11.64	-85.04
Observations	180	180	180	180	180	180	180	180

Note: The figures in parentheses indicate the values of standard errors. *** Significant at 1%. ** Significant at 5%. * Significant at 10%.

Table 7. Estimation Results Concerning the Number of Job Seekers among Full-Time Workers

	Kobe	Nada	Amagasaki	Nishinomiya	Itami	Akashi	Sumoto	Seishin
Industrial production index	1.0450 ** (0.515)	0.3945 (0.593)	0.4228 ** (0.204)	0.7763 *** (0.284)	0.7129 ** (0.288)	0.6207 * (0.319)	-0.0755 (0.394)	0.0387 (0.393)
Short-term	-0.2900 (0.265)	-0.1482 (0.170)	0.0115 (0.088)	-0.1243 (0.090)	-0.0026 (0.184)	0.3778 *** (0.067)	0.2398 ** (0.101)	0.4899 *** (0.072)
Medium-term	-0.0578 (0.205)	-0.0135 (0.216)	-0.0251 (0.204)	-0.0425 (0.153)	-0.0361 (0.198)	0.1260 (0.125)	0.0336 (0.139)	0.1019 (0.140)
Long-term	-0.1440 (0.179)	-0.1561 (0.223)	-0.0407 (0.261)	-0.0951 (0.202)	-0.0283 (0.242)	0.1182 (0.194)	-0.0007 (0.161)	0.0551 (0.182)
Constant term	0.1520 (0.146)	0.1373 (0.210)	0.0812 (0.246)	0.1161 (0.190)	0.1053 (0.216)	-0.0683 (0.164)	0.0295 (0.147)	-0.0268 (0.147)
Degree of AR term	2	1	3	3	9	1	1	1
Degree of MA term	1	0	0	0	1	1	1	1
Log likelihood	73.35	32.42	165.6	126.4	144.2	91.82	35.08	62.81
Observations	180	180	180	180	180	180	180	180

Note: The figures in parentheses indicate the values of standard errors. *** Significant at 1%. ** Significant at 5%. * Significant at 10%.

the number of new vacancies for full-time workers rose steeply in the short term in these areas. We did not observe any notable trend regarding the medium- and long-term impact. As in the case of part-time workers, although demand for full-time workers grew in the short term, that did not lead to an increase in the number of job placements. Comparison between the estimation results concerning the numbers of new vacancies for part-time and full-time workers does not suggest that the industrial structure of the disaster areas changed after the earthquake. Of course, it will be necessary in the future to monitor changes in the number of vacancies on an industry-by-industry basis, as Ewing, Kruse, and Thompson (2009) did.

Finally, Table 7 shows the estimation results concerning the number of new job seekers among full-time workers. The coefficient of changes in the industrial production index was positive with regard to all areas except for Sumoto. Unlike in the case of part-time workers, the coefficient was not significantly negative with regard to any area. Rather, the coefficient was significantly positive and the value was large with regard to Akashi (0.3778), Sumoto (0.2398) and Seishin (0.4899). That this is not because changes before the earthquake were very small is clear from the values of the constant terms, -0.0683 for Akashi, 0.0295 for Sumoto and -0.0268 for Seishin. These values are not statistically significant. Thus, even though the number of new job seekers remained flat or rose compared with the pre-earthquake level and the number of new vacancies also increased in the short term, the number of job placements declined steeply. That is probably because there was a supply-demand mismatch. As the coefficients of the medium- and long-term dummies were not statistically significant with regard to any area, it is presumed that job hunting activity returned to the pre-earthquake condition in the medium and long terms.

VI. Conclusion

Although over one year has passed since the Great East Japan Earthquake, restoration and reconstruction work is still far from completion. It is an urgent task to stabilize local residents' lives and rebuild infrastructure. It is necessary to draw up a long-term vision of how to rebuild and transform the disaster-affected areas in the future while tackling challenges that require immediate response. We believe that future reconstruction work in East Japan will be carried out efficiently if we draw up a long-term vision of reconstruction in light of the changes that the labor market and industrial structure of the Hanshin-Awaji region have undergone over the 17-year period since the Great Hanshin-Awaji Earthquake. With such motivation, this paper examined the short- medium- and long-term impacts of the Great Hanshin-Awaji Earthquake on the labor market in the disaster-affected areas.

Regarding part-time workers, while the number of new vacancies rose in the short term, the number of new job seekers declined and the number of job placements dropped steeply. As a result of the analysis of the number of new job seekers, it was observed that in many

parts of the disaster stricken region, the number of job placements declined steeply in the short term, followed by a substantial rebound in the medium term and by a fallback in the long term. This trend was particularly notable in the eastern parts of the disaster-stricken region, including Kobe, Nada, Amagasaki, Nishinomiya and Itami. It is presumed that the decline in the number of part-time job placements after the earthquake resulted from a labor supply shortage.

As for full-time workers, it has been empirically observed that the growth in job placements dropped steeply even though the growth in the number of new vacancies and new job seekers rose or remained flat in the short term compared with the pre-earthquake level. This was presumably due to labor supply-demand mismatch. The values of the coefficients alone seem to suggest that the number of job placements for full-time jobs would recover in the medium term, followed by a decline in the long term, as in the case of part-time jobs. However, we cannot regard that as a definite trend since it is not statistically significant.

Future tasks include examining the changes in the industrial structure based on industry-specific analysis and identifying the cause of the mismatch observed with regard to full-time workers.

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How Will the 3.11 Earthquake Transform the Population and Labor Market in Iwate, Miyagi and Fukushima?: Knowledge Gained from Existing Studies of Disasters

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Based on existing studies of disasters, one can see that human capital and being on the path to growth are the two keys to the recovery of the disaster-afflicted areas. If human capital outflows due to the nuclear power plant accident are also taken into account, the damage to human capital in Fukushima Prefecture has been immense, and given that the underlying trend of the economy there was somewhat stagnant even before the disaster, one would expect that it will take longer to achieve recovery there than in the other two prefectures, and that it will be difficult to regain its previous population and scale of employment. On the other hand, the scale of the damage to human capital in Iwate and Miyagi Prefectures was about the same scale as that seen in Kobe as a result of the Great Hanshin Awaji Earthquake. It is anticipated that the post-disaster reconstruction of Miyagi Prefecture, which was on the path to growth to some extent before the disaster, will progress rather more smoothly than it will in Iwate Prefecture, where the pre-disaster economy was somewhat stagnant. In fact, if one looks solely at trends in employment, the economic climate and population, one can see that the path to recovery from the aftermath of this disaster through to the present day has followed a path that runs broadly in line with projections.

I. Introduction

The magnitude 9.0 earthquake and massive tsunami on a scale rarely seen over the course of history that struck East Japan on March 11, 2011 caused unprecedented devastation for the citizens of the Tohoku region, focused primarily on Iwate, Miyagi and Fukushima Prefectures. It was the worst disaster to assail Japan since the end of World War II, with 19,317 people dead or missing and more than 350,000 homes completely or partially destroyed, while the number of evacuees fleeing their hometowns reached 400,000 at its peak (figures announced by the National Police Agency on December 20, 2011). In particular, Fukushima Prefecture, where the Fukushima Daiichi Nuclear Power Plant is located, suffered the triple-whammy of a major earthquake, a huge tsunami and a nuclear disaster, causing incalculable human and economic damage.

Most of the disaster-afflicted areas were already suffering from severe aging of the population even before the disaster, with a gradual but ongoing exodus of the younger population, so there is concern that this major disaster will bring about a further outflow of the population. Above all, there is a strong possibility that the outflow of population and employment will be more acute in Fukushima Prefecture than in other disaster-afflicted areas, due to the impact of the nuclear power plant accident.

This March marked the passage of a year since the occurrence of the Great East Japan Earthquake. Data concerning the population and employment, including in the disaster-afflicted areas, is being published, albeit only in piecemeal fashion, and we are now beginning to be able to grasp—to some extent—the degree to which reconstruction has progressed. In this study, the author would like to use the latest statistical data, together with knowledge gained from existing studies of disasters, in order to consider with the reader the future direction of the population and labor markets in these three Tohoku prefectures (Iwate, Miyagi and Fukushima Prefectures).

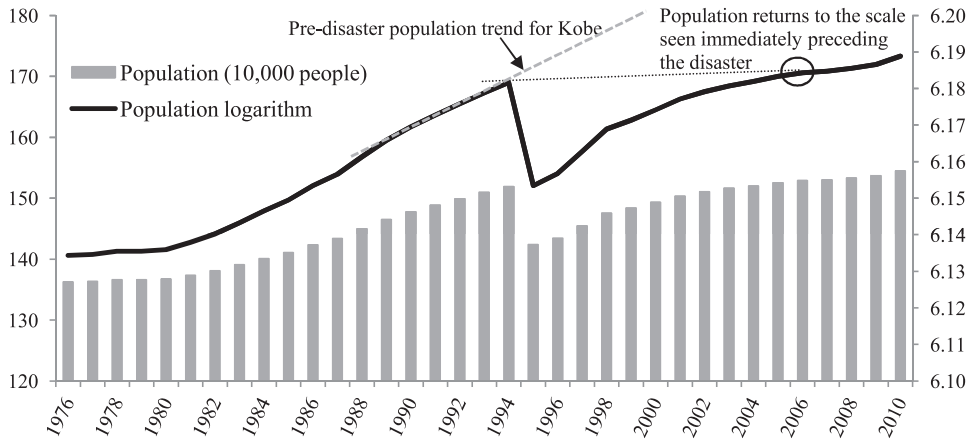
II. The Two Keys Determining the Pace and Degree of Reconstruction

1. Human Capital Will Determine the Pace of Reconstruction More Than Physical Capital

According to research carried out both within Japan and overseas concerning the history of natural disasters, although economic activity, the population, and workforce markets contract temporarily in the aftermath of a major disaster, there are many cases in which they subsequently rebound strongly and experience a renaissance. For example, the 1871 Great Chicago Fire burnt down more than 17,000 houses, resulting in more than 100,000 people losing their homes, but by 1880, not only had homes for those 100,000 people been rebuilt, but also the city of Chicago was able to take in a further 200,000 new citizens. In San Francisco in 1906, an earthquake caused an exodus of 200,000 people, equivalent to half the total population of the city, but by 1910, just four years later, the city had recovered to its previous population level (Vigdor 2008).

One of the main reasons why both Chicago and San Francisco were able to recover from disaster so quickly is believed to be the fact that there was little human damage. According to official statistics, the number of people who died in the fire in Chicago and the earthquake in San Francisco was no more than around 300 and 500, respectively (Bales 2005; Bronson 2006).

Rather than physical capital, such as houses, factories, equipment and infrastructure, the key to economic activity is usually human capital, such as the knowledge, skills and know-how of living people. For example, according to estimates in Mankiw (1997), the degree to which physical capital factors have contributed to past economic growth in the US is no more than around 14%-25%, with two-thirds to three-quarters of economic growth resulting from human capital factors, such as technological innovation and labor inputs. In addition to this, physical capital recovers much faster than human capital. If the quantity of physical capital is limited, it is possible to restore production activities more rapidly by increasing inputs of manpower or increasing the labor productivity of employees. Accordingly, even if a municipality suffers immense damage to its physical capital as a result of a natural disaster, that municipality can be expected to recover comparatively quickly if the human



Note: Compiled by the author from Kobe City Government (2011), *Dai 87 Kai Kobeshi Tokeisho Heisei 22 Nendoban* [87th Kobe City Statistical Yearbook: FY2010 Edition].

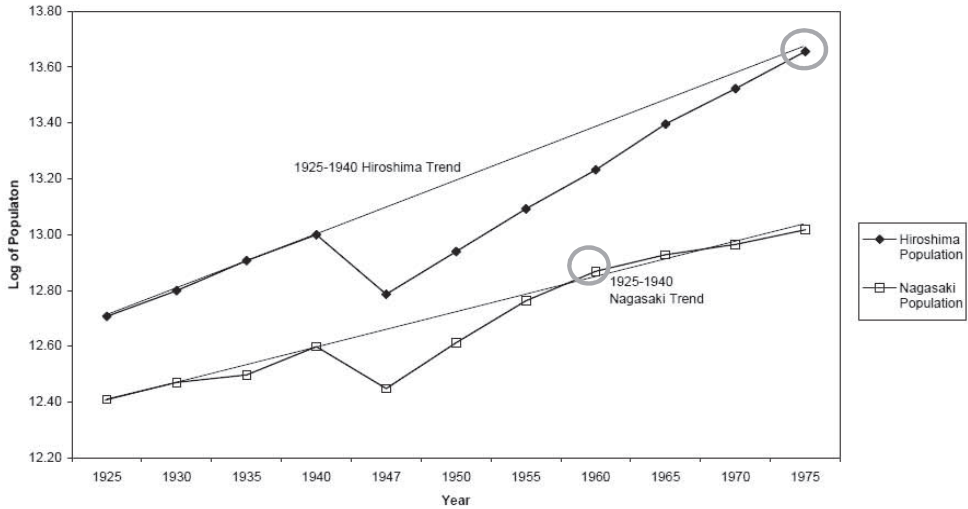
Figure 1. Changes in the Population of Kobe (1976–2010)

damage is small.

In fact, if one compares past examples of disaster recovery, one can see that in municipalities where the scale of the damage to physical capital is about the same, the subsequent reconstruction and recovery of the population took longer in those municipalities where the human damage was greater.

An example of this can be seen in Kobe, following the Great Hanshin Awaji Earthquake, in which the scale of damage to homes was about the same as that resulting from the San Francisco earthquake. In the Great Hanshin Awaji Earthquake of January 1995, which is still fresh in the memories of the Japanese people, more than 100,000 houses were completely or partially destroyed, resulting in more than 200,000 people losing their homes, while the number of people who left Kobe was approximately 100,000 at its highest (Kobe City 2012). Moreover, more than 4,500 people lost their lives in Kobe as a result of this disaster, so one can see that the number of victims was much higher than in the case of the San Francisco earthquake. As a result, Chicago was able to recover its previous level of population in the space of four years, but it took Kobe until around 2005—ten years after the disaster—to recover its previous population level (Figure 1). Moreover, even as of 2010, the population growth curve for Kobe had still not returned to the pre-disaster trend, so one could not say that the effects of the disaster had completely disappeared.

Moreover, in the cases of the cities of Hiroshima and Nagasaki, which both suffered atomic bomb attacks, it took 15 years longer for the population to return to its original level in Hiroshima, where the number of victims was greater (20.8% of the total population died), than in Nagasaki, where there were comparatively fewer victims (8.5% of the total population died). According to Davis and Weinstein (2002), the impact of the atomic bombs on population



Source: Davis and Weinstein (2002).

Figure 2. Population Growth Trends and Actual Figures for Hiroshima City and Nagasaki City (1925–1975)

growth had attenuated more or less to zero by 1960 in Nagasaki City, while in Hiroshima City, the effects continued until 1975 (Figure 2).

2. The Degree of Reconstruction Differs Considerably, Depending on Whether a Municipality Is on the Path to Growth or Has a Stagnant Economy

Another key to recovery is whether or not the municipality affected is on the path to growth before the disaster occurs. Vigdor (2008) points out an important lesson: “temporary shocks may have little long-run impact in growing cities, but they fundamentally change the fate of declining cities.”

One example of this, albeit not in relation to a natural disaster, is the V-shaped recovery experienced after World War II by Japan’s urban areas, which had suffered immense damage as a result of the war. During World War II, 66 Japanese cities, including Tokyo and Osaka, were subject to fierce air raids carried out by the USA, resulting in the destruction of more than half of all buildings and the loss of two-thirds of production capacity. The human damage was also immense. More specifically, 300,000 people lost their lives, while 40% of the total population lost their homes.¹

Davis and Weinstein (2002) plotted a correlation diagram showing the degree of damage resulting from aerial attacks (number of buildings completely destroyed per capita

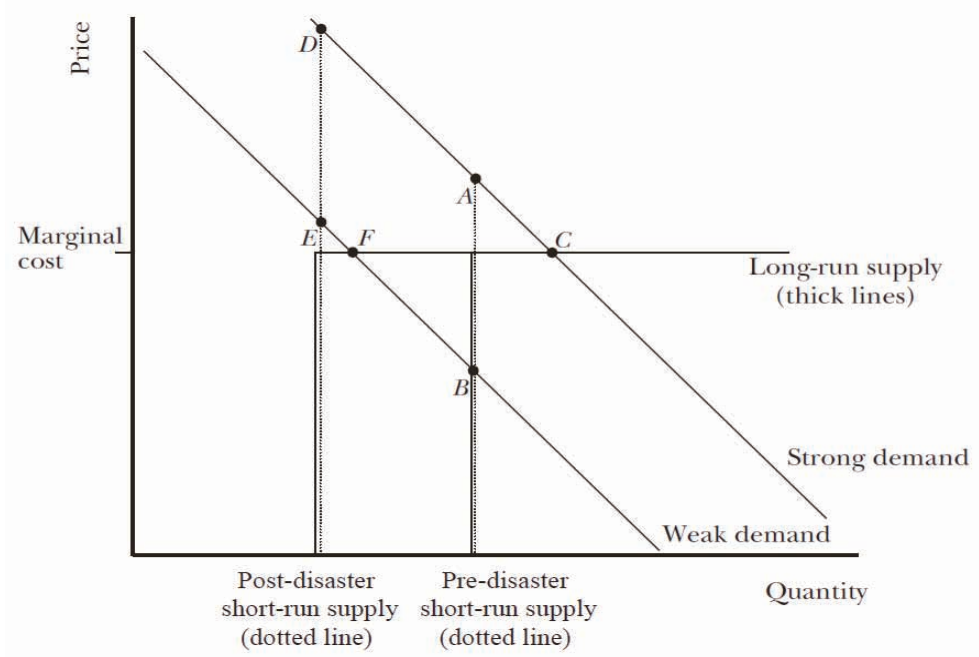
¹ United States Strategic Bombing Survey. *Summary Report (Pacific War)*. (Washington, D.C.: Government Printing Office 1946). <http://anesi.com/ussbs01.htm>.

and number of deaths) and the postwar economic growth rate, from which they discovered that the greater the severity of the damage sustained by a city as a result of the air raids, the higher was its economic growth rate during the postwar period (1947-1960). Moreover, in their analysis based on rigorous statistical estimates, it emerged that the impact of the US military's air raids on the scale of the population of a city was not permanent, but rather was a temporary shock. The effects of this temporary shock attenuated at a very rapid pace, in proportion to the scale of the damage, and it is reported that its impact on the scale of the population of cities diminished to zero over the course of 15-20 years, on average.

As Davis and Weinstein (2002) pointed out, there is a strong possibility that the cities chosen as targets for aerial attacks were cities that had high potential growth rates in the first place. For these cities, which were on the path to growth, major air raids were no more than a temporary shock, and it did not take that long for them to catch up with the population growth of other cities that did not suffer damage from aerial attacks (such as Kyoto and Sapporo).

On the other hand, the city of New Orleans in the USA is an example of a municipality that experienced a major natural disaster during a period of stagnation. As a result of Hurricane Katrina, which occurred in August 2005, 80% of the total land area of New Orleans was flooded, more than 1,200 people lost their lives, and the number of people who were forced to evacuate their homes reached 450,000 at its highest. The economy of New Orleans had been stagnating since before the disaster and the city faced such problems as population decline, outflows of employment and wages that were lower than the national average (Dolfman, Wasser, and Bergman 2007). According to the US population census carried out in 2000, before the disaster, the only strong industrial sectors in New Orleans were the entertainment and tourism, and coastal transportation sectors and the employment situation was very harsh, with employment opportunities for a further 37,000 people needing to be created in order to bring the city up to the national average employment level (Vigdor 2008). Consequently, it would appear that Hurricane Katrina inflicted a fundamental blow on New Orleans, which was a municipality in stagnation.

In Figure 3, Vigdor (2008) forecast the medium- to long-term decline in the scale of the population in New Orleans. Before the disaster, New Orleans was already facing a decline in employment and population, while the demand for the construction of new houses was so weak that the market price of a house was lower than the marginal cost of building a new house. To put it another way, in pre-disaster New Orleans, demand and supply in the housing market were in equilibrium at Point B. After the disaster occurred, the housing stock decreased considerably and it was not possible for the construction of new houses to keep pace with the demand for housing. Consequently, the housing price in New Orleans rose considerably in the immediate aftermath of the disaster, halting temporarily at Point E. However, as time passes, the construction of new houses will continue to a point at which the marginal cost of housing construction and the market price of houses correspond with each other, eventually reaching long-term equilibrium between demand and supply at Point F.



Where strong demand = path to growth

A: Pre-disaster equilibrium point

D: Pass point immediately after the disaster

C: Post-disaster equilibrium point

Where weak demand = stagnant economy

B: Pre-disaster equilibrium point

E: Pass point immediately after the disaster

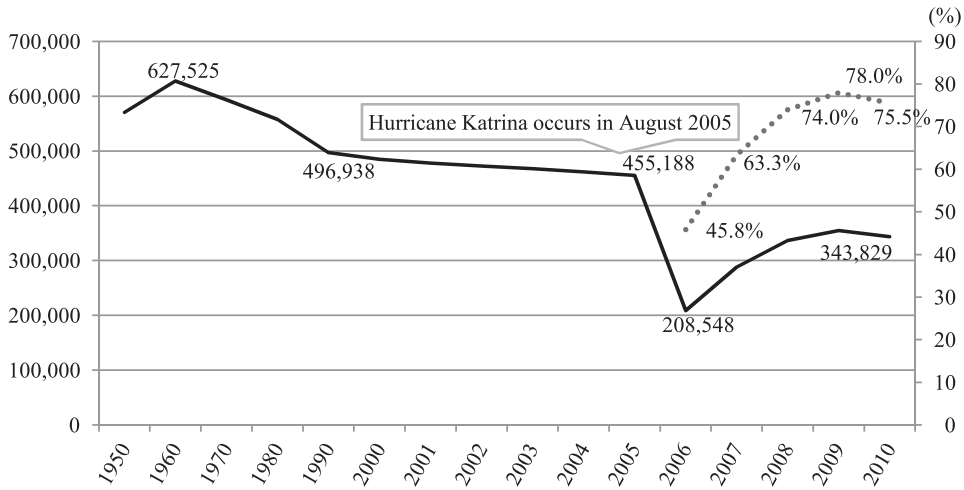
F: Post-disaster equilibrium point

Source: Vigdor (2008).

Note: Chicago in 1871 is given as an example of a municipality with strong demand, which was on the path to growth before the disaster. Population was flowing gradually into the municipality from before the disaster, and the market price of housing was higher than the marginal cost of housing construction (in equilibrium at Point A). As a result of the disaster, the price of housing temporarily jumps to Point D, but eventually reaches a new equilibrium at Point C. In that situation, the impact of the disaster is temporary and it is deemed to have no effect on the medium- to long-term growth of the municipality.

Figure 3. The Post-Disaster Recovery Scenario Differs According to Whether the Economy Is on the Path to Growth or Stagnating

Compared with the previous equilibrium point (Point B), not only has the quantity of housing stock declined at the new equilibrium point (Point F), but the price has also risen. In other words, in the projection in this model, it would seem that the average price of housing in post-disaster New Orleans will rise compared with the pre-disaster level, while the scale of the municipality will decreased in terms of both the population and the number of houses.



Source: Compiled by the author from statistical values published by the United States Census Bureau.

Note: Figures for 2006 - 2009 are projected values as of July 1 each year. The other figures are values shown in the census for April 1 each year.

Figure 4. Changes in the Population Scale of New Orleans and the Post-Disaster Population Recovery Rate (dotted line) (1950–2010)

In fact, the projection by Vigdor (2008) more or less hits the mark. As can be seen from Figure 4, the population of New Orleans rebounded strongly during the first three years after the disaster, recovering to 74% of its pre-disaster scale by 2008. However, the population increase subsequently slowed gradually, and had more or less stopped by 2009, four years after the disaster. According to the 2010 US population census, the population of New Orleans remained around 30% lower than it had been ten years previously, and the scale of the municipality was slightly smaller than it had been before the disaster.²

Housing prices in New Orleans also rose after the disaster, in line with the projections of Vigdor (2008). For example, in the case of the district of New Orleans known as Orleans Parish, whereas the contract price of a single house (average for September–December each year) was US\$203,435 in 2004, before the disaster, it rose considerably in the immediate aftermath of the disaster, reaching US\$357,063 (up 75.5%) in 2005. Although the price of a single house declined somewhat thereafter, as of 2011, the average price in the district in question continues to be high, at US\$258,322, 27.0% higher than the pre-disaster average.³

² Campbell Robertson, “Smaller New Orleans after Katrina: Census Shows,” *New York Times*, February 3, 2011.

³ Figures calculated by the author, based on market statistics published by the New Orleans Metropolitan Association of Realtors (<http://www.nomar.org/>).

III. Post-Disaster Labor Markets

1. Positive Shocks Resulting from a Disaster Bring about an Increase in Employment Opportunities

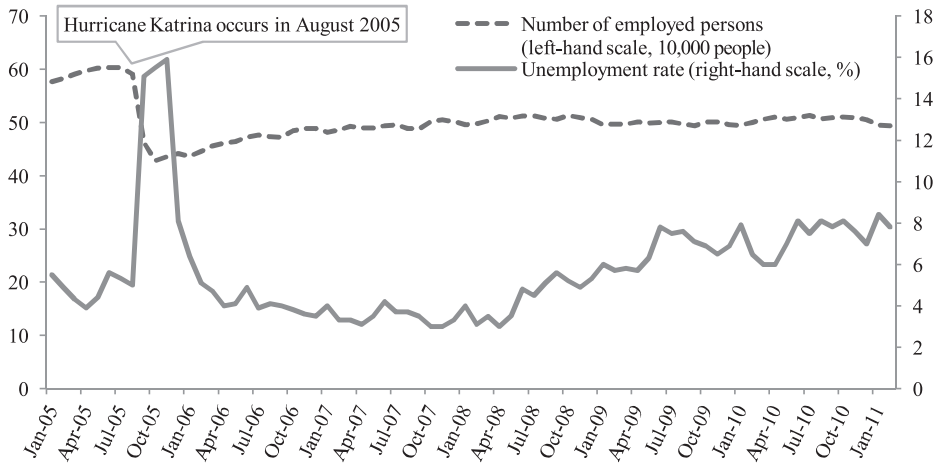
Large-scale disasters also cause serious damage to employment. They cause a decline in employment opportunities, at least temporarily, throughout industry as a whole, with the destruction of factories and production equipment affecting employment in manufacturing industry, while disruption to infrastructure and transport networks has a similar effect in the travel and tourism industry, as does the fall in consumer demand—resulting from population exodus—in the distribution, retail, service and real estate sectors.

However, at the same time, disasters also bring about an increase in employment opportunities. This is because the restoration of infrastructure (roads, bridges, buildings, power transmission lines, etc.), production equipment and homes destroyed by a disaster can be anticipated to have an effect equivalent to economic stimulus packages focused on fiscal stimulus. The increase in employment opportunities brought about by a post-disaster boom is called a “positive shock” by Chappell et al. (2007). In other words, although the employment situation in a disaster-afflicted area generally deteriorates significantly in the immediate aftermath of a disaster, employment opportunities should subsequently actually increase compared with the pre-disaster situation, due to the positive shock.

A familiar example of this can be seen in post-earthquake Kobe. In fact, 1995, when the disaster occurred, was the year that saw the city’s economy at its most buoyant since the collapse of the bubble economy. Despite the fact that the earthquake occurred in January, Kobe’s GDP growth rate for the whole of 1995 reached 1.4%, 0.8 points higher than the figure recorded in 1994, immediately before the disaster (Horwich 2000). One can see the positive shock of the earthquake from employment-related indicators, such as the rise in the active opening ratio and the fall in the unemployment rate that occurred immediately after the disaster.⁴

There are quite a few cases in which the effect of this positive shock lasts for a comparatively long time for municipalities on the path to growth. For example, in a paper in which Ewing, Kruse, and Thompson (2005) analyzed time-series data for the USA, calculations showed that the sequence of reconstruction activities that followed Hurricane Bret in 1997 resulted in a 0.75% fall in the natural rate of unemployment in Corpus Christi, Texas. In the case of the aforementioned Kobe as well, it is believed that the effect of the positive shock was sustained over a comparatively long period.

⁴ For detailed figures, see Mitsubishi UFJ Research and Consulting, “Chosa Repoto: Higashinohon Daishinsai ga Koyo ni Oyobosu Eikyō—Hanshin Awaji Daishinsai kara Eta Kyokun wo Moto ni (2011 nen 9 gatsu) [Survey report: The impact of the Great East Japan Earthquake on employment—Based on the lessons learned from the Great Hanshin Awaji Earthquake (September 2011)].” http://www.murc.jp/report_pdf/20110926_175605_0466081.pdf (accessed August 2012).



Source: Compiled by the author from United States Bureau of Labor Statistics, *Local Area Unemployment Statistics*.

Figure 5. Changes in the Number of Employees and the Unemployment Rate before and after the Disaster in the New Orleans-Metairie-Kenner Region (January 2005– February 2011)

According to Horwich (2000), Kobe experienced a post-disaster population exodus of at least 100,000 people at its highest, the majority of whom are believed to have been workers with some level of professional skills. However, the recovery in employment in Kobe in the immediate aftermath of the disaster was astonishing. According to the Ministry of Internal Affairs and Communications “Establishment and Enterprise Census,” the number of employees working at all establishments and enterprises in Kobe recovered to 789,000 people by the year after the earthquake (October 1996), which was an increase of 17,000 people compared with the situation in July 1991, four years before the disaster. Although it is not the case that there was an uninterrupted pickup in post-disaster employment,⁵ the figure for the number of employees in Kobe in the most recent (2009) Economic Census carried out by the Ministry of Internal Affairs and Communications demonstrated a recovery to 788,000 people, a level that was higher, albeit only slightly, than the pre-disaster scale of employment.

On the other hand, in the case of municipalities experiencing stagnation, such as New Orleans, the expansion in employment opportunities brought about by the positive shock did not last long. Although the number of employees in New Orleans decreased considerably initially (peaking at a 27.5% fall as of October 2005), the figure gradually increased as reconstruction of the municipality subsequently took place, with the scale of employment recovering to 80% of the pre-disaster level by August 2006, a year after the disaster (Figure 5).

⁵ The number of employees in Kobe declined to 719,000 in 2006, a fall of 7.0% compared with the pre-disaster level in 1991 (Kobe City Government 2007).

However, no marked improvement in the scale of employment was seen thereafter, and the total number of employees remains stagnant at around 80% of the pre-disaster level.

2. Patches of Light and Shade Emerge in the Changes in Average Wages in Disaster-Afflicted Areas and Areas Accepting Evacuees

What is perhaps somewhat unexpected is that a rise in average wages in disaster-afflicted areas is anticipated following a large-scale natural disaster. There are two main reasons for this. The first is the decline in workforce supply. When a major natural disaster occurs, a large number of fatalities and other casualties often result, and it is not unusual for tens or even hundreds of thousands of citizens to be compelled to evacuate their local communities. As a result, there is a tendency for the decline in the total labor force to become more pronounced than the fall in the volume of workforce demand. In that situation, it is likely that average wages after the disaster will actually rise (Vigdor 2008). The second reason is the culling of low-wage industries. In many cases, it is not possible for companies that had been weak in the first place and industries that lacked competitiveness to resume their business after a natural disaster, and average wages in the disaster-afflicted area are thought likely to rise as a result of these low-wage industries and companies being weeded out.

In the case of New Orleans, many of the industries that suffered the greatest damage as a result of the disaster (such as the retail and accommodation sectors) were low-wage industries, so the average wage rose by as much as 29.4% after the disaster (Dolfman, Wasser, and Bergman 2007). In the study by Vigdor (2008) as well, a rise in the average wage was reported in most business categories after the disaster.

As can be seen from Figure 6, in all of the industries other than entertainment, public utilities and the information industry, the average wage rate (wage per hour) of employees in New Orleans rose. The biggest rates of increase were seen in the industries for which there was the greatest need in the process of post-disaster reconstruction. A large volume of garbage was generated as a result of the disaster, so the wage rate in the waste disposal sector rose by more than 50%. Moreover, the transport and storage of relief supplies was required, so the wage rate in the transportation and warehousing sector rose by more than 40%. Furthermore, most of the city's housing was destroyed by the disaster, so wage rates in the construction industry, which is responsible for building houses, and in the real estate business, which serves as an intermediary in the sale of homes, demonstrated high growth rates of just under 40% in both cases.

However, there is a possibility that a natural disaster might have a negative impact on the wage levels of local citizens outside the disaster-afflicted area. In particular, a fall in the average wage is anticipated in areas that take in a large number of evacuees from disaster-stricken areas. In the case of Hurricane Katrina, 100,000–150,000 evacuees from the disaster-afflicted area poured into the nearby Houston metropolitan area, resulting in a population



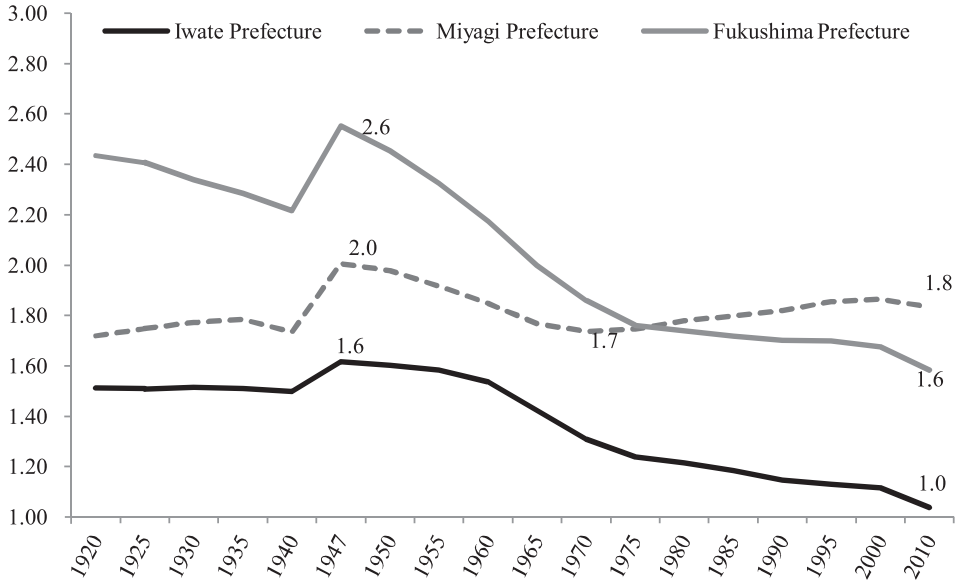
Source: Vigdor (2008).

Figure 6. Changes in Average Wage Rates after the Disaster in Orleans Parish, New Orleans (% , 2nd Quarter of 2005–2nd Quarter of 2007)

increase of 3-4%. It was expected that most of these evacuees would subsequently settle permanently in the Houston metropolitan area.⁶

In order to precisely measure the impact of Hurricane Katrina, during the period October 2005–October 2006, a section featuring questions that would enable analysts to determine whether or not a respondent was a Hurricane Katrina evacuee was incorporated into the questionnaires for the Current Population Survey (CPS), which is carried out monthly on a nationwide scale by the United States Bureau of Labor Statistics. Based on the individual data from the survey, McIntosh (2008) used a DID (Difference-in-Difference) model to compare disparities in wages and employment rates, comparing the situations before and after the disaster, as well as looking at differences between local citizens in the Houston metropolitan area and citizens of other cities that were not affected by the disaster. As a result, it was discovered that the wages and employment rate (%) of local citizens in Houston fell by 1.8% and 0.5% respectively, due to the massive influx of evacuees.

⁶ Susan Saulny, “Putting Down New Roots on More Solid Ground,” *New York Times*, September 7, 2005.



Sources: Compiled by the author from Ministry of Internal Affairs and Communications, *2010 Population Census* and National Institute of Population and Social Security Research, *Population Statistics of Japan (2011)*.

Note: These are the proportions of the total national population accounted for by the total populations of each prefecture.

Figure 7. Population Shares of the Three Tohoku Prefectures
(Unit: %, 1920–2010)

IV. Considering the Recovery of the Three Tohoku Prefectures

1. The Population and Labor Markets of the Three Tohoku Prefectures before the Major Earthquake

Pre-disaster Iwate Prefecture and Fukushima Prefecture actually had many similarities with New Orleans. On the other hand, Miyagi Prefecture was somewhere in the middle between New Orleans and Kobe in that, although it was not experiencing the problems of sustained population decline and underdeveloped tertiary industry, as was the case in New Orleans, neither was it on an upward path to growth, as was the case in Kobe.

From Figure 7, one can see that the population shares of Iwate and Fukushima Prefectures had been demonstrating a uniform downward trend since before the disaster. The proportion of the total population of Japan accounted for by the total populations of the two prefectures peaked at 4.2% in 1947, and these figures have been on the decline since then. By 2010, immediately before the earthquake, the share of the total population accounted for by the two prefectures had fallen to 2.8%. On the other hand, although the share of the total

population accounted for by Miyagi Prefecture had not been increasing by a great amount, no downward trend had been seen since 1970 (Figure 7).

The author believes the main cause of the decline in the population shares of Iwate and Fukushima Prefectures to be the fact that, just like New Orleans, they were seriously lagging behind in terms of the development of the information and communications industry and the finance and insurance industry, sectors that have been experiencing rapid growth in recent years. Due to the geographical conditions and the tradition of farming that they have inherited, both prefectures have a marked predominance in the fields of agriculture and forestry. Furthermore, Iwate Prefecture has made good use of another geographical condition, in the form of its location adjacent to the abundant fishing grounds of the Pacific coast, so the fisheries industry has historically been a major sector. However, neither prefecture was able to adeptly cultivate a service sector to follow the new trend, so employment opportunities for young people and households bringing up small children were limited.

Table 1 shows the figures for the degree to which the prefecture's share of employment exceeds its population share for each industry (unit: % points). One can interpret this to mean that the greater the excess in the employment share, the more that the industry in question within the prefecture absorbs a number of employees above the national average, making them dominant industries in the employment portfolio.

Looking at Table 1, one can see that the dominant industries in Iwate Prefecture (in order of the excess in the employment share) are forestry (+5.4 points), fisheries (+3.5 points), and agriculture (+1.9 points). The dominant industries in Fukushima Prefecture (in order of the excess in the employment share) are forestry (+1.6 points), agriculture (+1.6 points), and the electricity industry (+1.2 points). However, in almost all industries other than primary industries (excluding construction, electricity, gas, heat and water supply, and compound services), employment opportunities in the two prefectures are poorer than the national average.

On the other hand, while Miyagi Prefecture has in common with the other two prefectures a comparative advantage in the fisheries industry (+3.3 points) and the electricity industry (+0.6 points), it is catching up in terms of the development of its tertiary industries, to some extent. Of the tertiary industries, Miyagi Prefecture maintains an advantage—albeit slight—over the national average in the wholesale and retail (+0.19 points), education and learning support (+0.18 points), and transportation (+0.04 points) sectors. Thus, pre-disaster Miyagi Prefecture was experiencing moderate growth at around the same pace as the national average, and the scale of its population and employment was also stable.

2. The Path to Recovery As Understood from the Two Keys

As can be gathered from the studies of disasters carried out hitherto, there are two keys to the recovery of disaster-afflicted areas. More specifically, these are human capital and the path to growth.

Table 1. Employment Share Excess Rate by Industry in the Three Tohoku Prefectures

$$\left(\frac{100 \times \text{Number of employed persons in the industry in question in the prefecture}}{\text{Number of employed persons in the industry in question nationwide}} - \frac{100 \times \text{Total population of the prefecture}}{\text{Total national population}} \right)$$

(Unit: % points)

	Iwate Prefecture	Miyagi Prefecture	Fukushima Prefecture	3 Tohoku Prefectures
Primary industry				
Agriculture	1.88	0.17	1.56	3.61
Forestry	5.37	-1.03	1.62	5.96
Fisheries	3.49	3.25	-0.71	6.03
Secondary industry				
Mining	1.64	-0.83	1.43	2.23
Construction	0.20	0.25	0.33	0.78
Manufacturing	-0.01	-0.34	0.34	-0.02
Tertiary industry				
Electricity, gas, heat supply & water supply	0.10	0.58	1.20	1.87
Information & communications	-0.52	-0.40	-0.88	-1.80
Transportation	-0.11	0.04	-0.22	-0.29
Wholesale & retail	-0.03	0.19	-0.08	0.08
Finance & insurance	-0.30	-0.24	-0.18	-0.72
Real estate	-0.50	-0.58	-0.97	-2.06
Catering & accommodation	-0.16	-0.11	0.04	-0.24
Medical care & welfare	0.16	-0.13	-0.06	-0.03
Education & learning support	-0.11	0.18	-0.21	-0.14
Compound services	1.07	0.02	0.39	1.48
Other service industry	-0.18	-0.07	-0.21	-0.46
Civil service (not otherwise classified)	0.06	0.26	-0.23	0.09
Industries unable to be classified	-0.59	-0.47	-0.70	-1.76
Total industry	0.03	-0.04	0.01	-0.01

Source: Compiled by the author from the 2007 *Employment Status Survey*.

Note: The population share of the total national population accounted for by the prefecture in question (2010) was 1.04% for Iwate Prefecture, 1.83% for Miyagi Prefecture and 1.59% for Fukushima Prefecture.

The first key is human capital. Damage to physical capital can be remedied in the short term, over a year or two, and it is comparatively simple to cover any shortfall by increasing the input of workforce and raising labor productivity. However, in the case of damage to human capital, which forms the core of production activities, it takes decades to

Table 2. Status of Damage and Recovery Forecast

	Iwate Prefecture	Fukushima Prefecture	Miyagi Prefecture
Damage to human capital	Moderate Number of victims: 5,975 people, equivalent to 0.45% of the population of the prefecture	Low Number of victims: 1,819 people, equivalent to 0.09% of the population of the prefecture or Immense if the damage resulting from the nuclear power plant accident is included	Moderate Number of victims: 11,266 people, equivalent to 0.48% of the population of the prefecture
Pre-disaster growth path	Somewhat stagnant	Somewhat stagnant	Somewhat on the path to growth
Damage from the disaster (expectation)	Semi-permanent	Semi-permanent	Temporary
Positive shock for reconstruction	Strong possibility that the effects will fade within a few years	Strong possibility that the effects will fade within a few years	Sustained effects: a boom and increased potential growth rate can be expected

Notes: 1. The number of victims is based on the National Police Agency, *Damage Situation and Police Countermeasures* (March 2, 2012). The figures for victims include those listed as killed and those listed as missing.

2. The population of the prefecture is the estimated population immediately before the Great East Japan Earthquake (as of March 1).

recover to the original level. Accordingly, the greater the damage to human capital, the longer recovery will take.

The second key is the path to growth of the municipality. If an area is on a path to growth, a major disaster will be no more than a temporary shock (damage), and its effects will eventually disappear completely. Moreover, the positive shock resulting from reconstruction demand will stimulate the local economy, so one can expect that the potential growth rate in the disaster-stricken area will increase. On the other hand, for municipalities with a stagnant economy, a major disaster shifts the equilibrium points for the scale of population and employment downwards, and it would seem that the impact of this will be semi-permanent. Moreover, it is anticipated that it will be difficult for the positive shock resulting from reconstruction demand to last a long time.

The scale of the damage to human capital in Miyagi and Iwate Prefectures due to this recent disaster is believed to be on about the same scale as that in Kobe resulting from the 1995 earthquake. Looking at Table 2, one can see that in Miyagi and Iwate Prefectures, 0.48% and 0.45% of the population of the respective prefectures fell victim to the disaster

(the figure for Kobe was 0.42%).⁷ On the other hand, in Fukushima Prefecture, although the number of victims as recorded in official statistics is lower than in the other two prefectures, at 0.09% of the population, there was a mass exodus from the prefecture of those of working age bracket, focused primarily on young people and households bringing up small children, due to the accident at the Fukushima Daiichi Nuclear Power Plant; given that there is little prospect of their return to the prefecture in due course, one should view the damage to the human capital stock of Fukushima Prefecture as being immense in comparison with the damage in the other two prefectures.

Moreover, given that Miyagi Prefecture was somewhat on the path to growth, whereas the economies of Iwate and Fukushima Prefectures were somewhat stagnant even before the disaster, there is a strong possibility that disparities will emerge in the time required for reconstruction and the degree of recovery in each of the three prefectures.

If one compares Iwate and Miyagi Prefectures, which suffered a more or less equivalent level of damage to human capital, one can see that the latter was on the path to growth, so reconstruction is expected to proceed more smoothly. This projection is not altered by the fact that the physical damage suffered by Miyagi Prefecture as a result of the disaster was far greater than that experienced by Iwate Prefecture. The number of buildings completely or partially destroyed in Miyagi Prefecture was 223,000, which means that the number of buildings completely or partially destroyed per 1,000 population was 94.9 (the figure for Iwate Prefecture was 18.7 buildings/1,000 population).⁸ However, not only can the effect of being on the path to growth make up for this loss, but also it will be necessary to rebuild more buildings, so the positive shock of reconstruction will actually be powerful, and there is a strong possibility that the economy of Miyagi Prefecture will experience a significant rebound following the disaster. On the other hand, in Fukushima Prefecture, where the damage to human capital has been immense and where the economy was somewhat stagnant even before the disaster, one would expect that it will take longer to achieve recovery there than in the other two prefectures, and that it will be difficult to regain its previous population and scale of employment.

3. The Status of Actual Post-Disaster Reconstruction Is Quite Closely Following Projections

If one looks solely at trends in employment, the economic climate and population, one can see that the recovery situation over the course of the year following this disaster has followed a route that runs broadly in line with theoretical projections.

⁷ The total number of victims in Kobe was 6,437 (Kobe City Government 2012), which is equivalent to 0.42% of the total pre-disaster population of Kobe (1.519 million) as of October 1, 1994.

⁸ National Police Agency, "Higai Jokyo to Keisatsu Sochi [Damage situation and police countermeasures]," March 2, 2012.

Table 3 shows changes in the number of new job openings, the active opening ratio and the diffusion index in the three Tohoku prefectures before and after the disaster. The number of new job openings indicates how many new jobs have been created. The active opening ratio (effective job openings/effective labor supply) indicates the balance of supply and demand in the labor force market; the higher the figure, the easier it is to find a job. On the other hand, the diffusion index (here, the DI coincident index is used) is a comprehensive indicator for gaining an understanding of economic trends; in general, if the DI value is above 50%, the economy is expanding, but if below, the economy can be deemed to be in recession.

Looking at Table 3, one can say that the number of new job openings and the active opening ratio in all three prefectures have been growing considerably since the disaster. The scale of the rise in all indicators has been in line with projections, with the biggest rises being seen in Miyagi Prefecture. The number of job openings in post-disaster Miyagi Prefecture has grown by between 1.5 and 1.8 times compared with the same month of the previous year; as of January 2012, the new opening ratio in the prefecture was 0.82, a rise of 0.33 points compared with the level of 0.49 recorded immediately before the disaster.

On the other hand, although Fukushima Prefecture was considerably further ahead of Iwate Prefecture in terms of both the number of new job openings and the active opening ratio during the period from immediately after the disaster until December 2011, the situation reversed in January 2012 and Iwate Prefecture took the lead.⁹ The author believes that these figures predict that it will be more difficult for Fukushima Prefecture to achieve a full-scale recovery in employment than it will be for Iwate Prefecture, as although the growth in employment in the former was faster than in the latter for a time, due to the need to deal with the nuclear power plant accident, the exodus of human capital from Fukushima Prefecture in the medium to long term is immense.

In addition, it was ascertained that economic expansion took place in Miyagi Prefecture for five consecutive months from August 2011, but the economy in Fukushima Prefecture entered a recessionary phase for a time in October and November that year (the relevant figures for Iwate Prefecture have not been published, so it is not possible to draw a comparison with other prefectures).

The status of the recovery in the total population of each prefecture has progressed broadly along the lines indicated by projections. The (estimated) population exodus from Miyagi Prefecture mostly stopped in May 2011, but a moderate outflow of the population subsequently continued in Iwate Prefecture. On the other hand, the population of Fukushima Prefecture has been departing faster than the outflow from Iwate Prefecture. If the population immediately before the disaster, as of March 1, 2011, is set at 100, then the population

⁹ The reason for this is unclear. The author surmises that this is because a large workforce was initially required to deal with the accident at the Fukushima Daiichi Nuclear Power Plant, but from 2012, the work required to deal with the nuclear power plant accident had tapered off, so related employment declined.

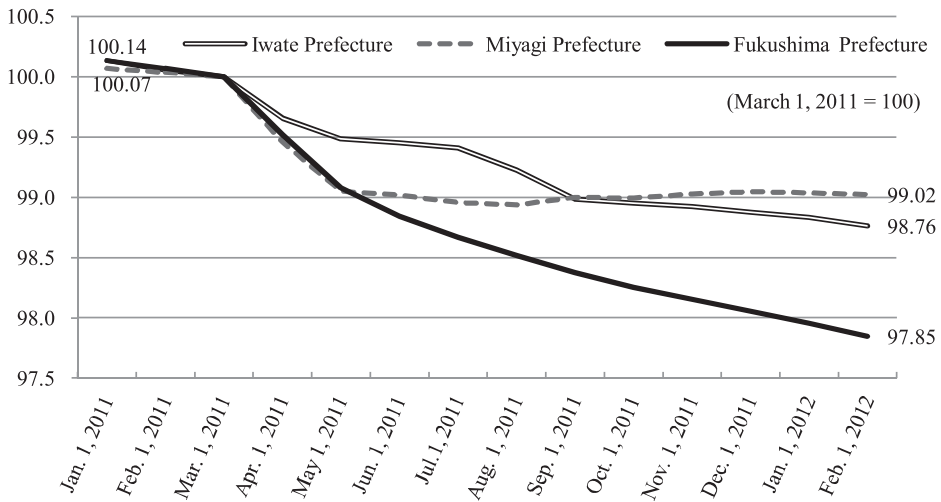
Table 3. Changes in the Active Opening Ratio and the Diffusion Index (January 2011–January 2012)

	Number of new job openings (same month of the previous year = 100)			Active opening ratio (seasonally-adjusted value)			Diffusion index (DI coincident index)		
	Iwate	Miyagi	Fukushima	Iwate	Miyagi	Fukushima	Iwate	Miyagi	Fukushima
Jan-11	110.8	103.9	118.3	0.48	0.50	0.49	44.4	77.8	77.8
Feb-11	114.9	116.6	121.2	0.50	0.51	0.49	55.6	77.8	77.8
Mar-11	82.6	82.3	83.2	0.46	0.49	0.49	14.3	28.6	37.5
Apr-11	117.7	131.4	136.2	0.42	0.46	0.50	42.9	0.0	0.0
May-11	142.3	158.3	133.0	0.47	0.49	0.51	-	14.3	6.3
Jun-11	124.2	157.6	150.0	0.49	0.54	0.58	-	22.2	75.0
Jul-11	136.9	162.9	144.5	0.56	0.63	0.62	-	33.3	75.0
Aug-11	130.7	166.3	148.5	0.57	0.69	0.64	-	71.4	100.0
Sep-11	124.0	159.3	143.6	0.59	0.73	0.67	-	85.7	55.6
Oct-11	141.9	158.0	141.0	0.63	0.73	0.68	-	85.7	44.4
Nov-11	143.5	150.4	169.5	0.65	0.78	0.70	-	88.9	44.4
Dec-11	148.9	167.4	152.6	0.69	0.79	0.74	-	100	66.7
Jan-12	158.2	180.3	148.6	0.75	0.82	0.74	-	-	-

Sources: Compiled by the author from Fukushima Labour Bureau, *Saikin no Koyoshitsugyo no Josei ni tsuite (Heisei 24 nen 1 gatsu naiyo)* [Concerning the recent employment and unemployment situation (January 2012 details)] (published March 2, 2012), Miyagi Labour Bureau, *Miyagiken no Ippan Shokugyo Shokai Jokyo (Heisei 24 nen 1 gatsu naiyo)* [General job placement situation in Miyagi prefecture (January 2012 details)] (published March 2, 2012), Iwate Prefecture FY2011 4th Meeting of the Iwate Prefecture Economic and Employment Measures Task Force Data Materials 2, *Koyo Josei no Genjo ni tsuite* [The Current Employment Situation] (meeting held February 6, 2012), and the diffusion indices published by the respective prefectural governments.

Notes: 1. The diffusion index for 2005 is set at 100.

2. No diffusion index has been published for Iwate Prefecture since May 2011.



Sources: Compiled by the author based on the monthly estimated population figures published by each prefecture.

- Notes: 1. The monthly population estimates are made by taking the permanent population (as of October 1) from the Population Census carried out in 2010 as the benchmark, while adjusting for the number of notifications of births, deaths, inward migrations, outward migrations, foreign national registrations and naturalizations recorded each month, with the result being viewed as the permanent population.
2. Despite the fact that people were actually relocating outside the prefecture, it is thought that there were many cases in which relocation procedures were not carried out, due to the post-disaster disruption, the allocation of donation money and compensation for the nuclear power plant accident. Consequently, there is a strong possibility that the aforementioned population estimates are higher than the actual situation. It will be necessary to await the results of the 2015 Population Census to see accurate figures that reflect the actual situation.

Figure 8. Changes in Population before and after the Disaster
(January 2011–February 2012)

as of January 1, 2012 was 99.02 in Miyagi Prefecture, 98.76 in Iwate Prefecture, and 97.85 in Fukushima Prefecture (Figure 8).

V. In Place of a Conclusion: Being Smaller, Being Wealthier

For the citizens of disaster-stricken areas, a major disaster does not bring only bad things. As pointed out in Horwich (2000), the new economy will never be a revised version of the pre-disaster economy. While they destroy physical capital, such as buildings and factories, disasters provide an ideal opportunity to attract new technology and investment. For

example, in the case of Kobe, it is reported that the living environment in the city was actually greatly improved after the disaster, through such initiatives as the introduction of a new type of sewerage system and a more efficient gas supply (Horwich 2000).

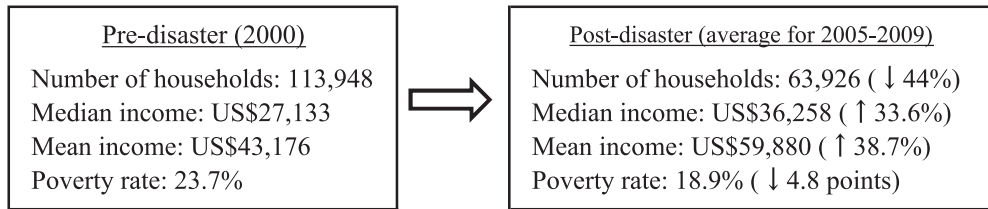
If local governments and the business community actually took advantage of the predicament caused by the Great East Japan Earthquake as an opportunity to implement reforms, such as improving the living environment, attracting new industries that make use of vacant lots, developing distribution networks, introducing new production technologies, and attracting the information and communications industry, there is a strong possibility that such reforms would progress more smoothly than they would have done before the disaster. If this can be achieved, it would seem to be possible to create a stronger economic system than existed in the disaster-afflicted areas before the disaster. In that sense, the disaster is both a crisis and a golden opportunity for the three Tohoku prefectures.

Due to their natural environments, siting conditions and traditions, etc., the agriculture, forestry and fishery industries are likely to continue to play a greater role in the future in these three Tohoku prefectures than in other regions. In the future, it will likely be necessary to increase the growth potential of primary industries through such endeavors as the introduction of new technologies to the agriculture, forestry and fishery industries, and enhancing and achieving greater efficiency in the service industries supporting the sale and distribution of agriculture, forestry and fishery industry produce.

There is little prospect in the disaster-stricken areas of the kind of population increase and employment expansion seen in Tokyo, Hiroshima and Nagasaki Prefecture after the end of World War II, but one can have high expectations that each and every citizen of those prefectures will become more affluent after the disaster. Attaining a richer lifestyle than before the disaster is more than just a dream: it can be achieved by accelerating the weeding out and restructuring of uncompetitive low-wage businesses, improving labor productivity per capita through the introduction of new equipment and technology, and increasing the quantity of social capital per citizen as a result of the decreased population. At present, there is no way to confirm using accurate statistics whether the citizens of these three Tohoku prefectures have truly become more affluent, but at the very least, a rise in the household incomes and average wages of employed persons in these three prefectures has actually been reported since the disaster.¹⁰

The author believes that the goal should be “being smaller, being wealthier.” A vision for the future in which, although municipalities themselves become a little smaller, the individual citizens living there become more affluent and happier would be splendid. Incidentally, comparing the situation before and after the disaster, the following changes were seen in New Orleans (Figure 9).

¹⁰ For example, according to the Ministry of Internal Affairs and Communications “Family Income and Expenditure Survey,” the average monthly income in 2011 in Iwate Prefecture (Morioka) in the households of workers other than single persons was ¥503,000, an increase of 3.0% above the pre-disaster level in 2010.



Note: Compiled by the author from data published by the United States Census Bureau.

Figure 9. Changes in New Orleans before and after the Disaster

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How Will the 3.11 Earthquake Transform the Population and Labor Market in the Disaster Areas?

(Heisei 24 nen, 1 gatsu 1 nichi genzai) [The Great Hanshin Awaji Earthquake: The damage situation and the status of reconstruction initiatives (as of January 1, 2012)]. <http://www.city.kobe.lg.jp/safety/hanshinawaji/revival/promote/img/hisaijyoukyou240101.pdf> (accessed August 3, 2012).

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Future Employment Policy Suggested by the Post-Earthquake Response

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This paper discusses employment policy measures that should be taken in an emergency, focusing on the measures actually taken in response to the Great East Japan Earthquake. When many workers were laid off immediately after the earthquake, employment adjustment subsidies were used to help employers maintain employment. However, the funds for such subsidies were soon nearly depleted. At the same time, people who were laid off or who lost their jobs but were ineligible for the subsidies were covered by extending unemployment benefits. The new job seeker support system was set up to provide training for people ineligible for employment insurance, while granting subsidies to training organizations. However, this new system, in its current state, leaves a large amount of room for improvement. Meanwhile, fund projects, which are flexible and convenient to use, worked well to some extent in preventing unemployment in the wake of successive crises such as Lehman Crisis and the Great East Japan Earthquake. When formulating employment policy, it is necessary to consider whether support should be provided intensively to individual enterprises with high job creation potential, or whether it should instead be provided to groups of enterprises. Designing a resilient employment system which can withstand a crisis is a challenge for the future.

I. Introduction

On April 8, 2011, I received an unexpected phone call in my office at the university. The person who called me was Mr. Kinya Takino, who held the office of Deputy Chief Cabinet Secretary at that time. He told me that the government had decided to set up an advisory panel, named the Reconstruction Design Council in Response to the Great East Japan Earthquake under the Prime Minister's direct authority, to obtain recommendations on measures for recovery from the earthquake that had happened one month previously. Mr. Takino asked me to join a study group to be formed as a subordinate body of the council. For a moment, I hesitated to reply to this sudden request. I wondered whether I would be able to undertake this assignment. When I asked him what he wanted me to do, he said he wanted me to work on employment policy. As a researcher of labor issues, I had no choice but to accept the request despite my initial trepidation.

The Council held its first meeting on April 14, 2011, and at its 12th meeting on June 25, it compiled its recommendations into a report entitled "Towards Reconstruction—Hope beyond the Disaster" and submitted it to then-Prime Minister Naoto Kan. During this period, the Council's Study Group met eight times from April 20 to June 14. The summaries and full texts of the minutes of the Council and the Study Group's meetings are all available on the Cabinet Secretariat's website (<http://www.cas.go.jp/jp/fukkou/english/index.html>). In addition to the Council and the Study Group, workshops were organized to hear the opin-

ions of the personnel of the ministries and agencies concerned who were in charge of the reconstruction process.

Having finalized and submitted their recommendations to the government, the Council and the Study Group had completed their activities. Subsequently, the recommendations were forwarded to the Reconstruction Headquarters in Response to the Great East Japan Earthquake, and at present, the Reconstruction Agency established as of February 10, 2012 plays a central role in implementing post-earthquake measures.

Amid all of these activities initiated by the government, I had the opportunity to observe the process of formulating reconstruction measures from a position close to the actual policy makers. In the field of employment policy, in particular, I had many opportunities to ask questions and exchange opinions with personnel of the Ministry of Health, Labour and Welfare (MHLW) as well as those of prefectural and municipal governments in the affected areas. In this paper, I will note what I felt about the employment measures taken during the year following the earthquake, in light of my comparatively good access to information on this issue.

The statements contained herein are brief descriptions of post-earthquake employment measures and my personal views on measures that were particularly impressive to me. I will not present a full explanation of the entire list of government-led employment measures. I recommend that those interested in more general information take a look at the *Japan As One Work Project* page on the MHLW website (http://www.mhlw.go.jp/seisakunitsuite/bunya/koyou_roudou/shigoto.html). This inter-ministerial project was launched immediately after the earthquake to support employment in the affected areas through nationwide efforts. Thus far, the project team has compiled its measures into three phases, Phase 1 (as of April 5), Phase 2 (as of April 27), and Phase 3 (as of October 25). The project was recognized as the core employment initiative when drawing up the supplementary budget for FY2011.

The *Japan As One Work Project* is the most notable post-earthquake employment measure carried out by the government. It covers a wide range of subjects, each of which will need to be studied by researchers in the relevant fields. I attended the Study Group's meetings with the belief that the recommendations to be finalized by the Council should complement this project.

II. Drafting Recommendations

Table 1 shows the recommendations I was drafting in early May 2011 with regard to emergency employment measures to be taken in response to the earthquake. I made remarks on the draft at the Study Group's meeting on May 11. The following is an extract from my remarks; the full version can be found in the summary of the minutes.

Table 1. Reconstruction Employment Policy Recommendations Drafted
by the Author (May 2011)

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- Employment recovery in the affected areas is one of the most pressing and highest priority challenges that need to be tackled in the reconstruction process. In order to ensure that disaster victims will be able to rebuild their lives, it is necessary to promptly create an environment where they can find employment and earn an income.
 - Since employment status and needs vary among disaster victims, a counseling system should be developed to provide comprehensive one-stop services, including continuous support and livelihood support as needed by each victim.
 - In order to provide detailed job matching services and vocational training programs, it is necessary to increase the staff at public employment security offices (generally called Hello Work offices) and reinforce collaboration among all parties concerned-private businesses, related organizations, NPOs, municipal and prefectural governments, and the national government.
 - A mechanism should be built to support local businesses now suffering from damage to their facilities and equipment or from debt burdens but which have the potential to recover, because these businesses are expected to provide employment to job seekers. Creation of special zones for reconstruction and a reconstruction fund will be included in this mechanism.
 - In order to create conditions that will entice job creating businesses into the affected areas, legislative and procedural improvements should be made to relax the requirements for the establishment of new businesses.
 - The projects undertaken to rebuild local communities should actively recruit local residents in the affected areas. The implementation of business-related projects requires the use of funds and know-how available in the private sector in addition to public funds.
 - With a view to providing greater employment opportunities mainly in the construction industry in response to labor demand for reconstruction projects in the affected areas, it is necessary to enhance vocational training programs so that disaster victims can acquire the specialized skills and knowledge necessary for reconstruction work.
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Source: From the report submitted to the fifth meeting of the Study Group of the Reconstruction Design Council in Response to the Great East Japan Earthquake (May 11, 2011), in the joint names of the author and other two members of the study group, Sawako Shirahase (professor, Graduate School of Humanities and Sociology, the University of Tokyo) and Hisashige Danno (Assistant General Secretary, Japanese Trade Union Confederation [RENGO]).

“First and foremost, employment recovery in the affected areas is one of the most pressing and highest priority challenges we should tackle in the reconstruction process. In order to ensure that disaster victims will be able to rebuild their daily lives, we need to promptly create an environment in which disaster victims can find employment and earn an income. From the viewpoint of respecting the dignity of disaster victims’ daily lives, a crucial prerequisite is to enable them to earn a living from working and to actually feel that they are contributing to the reconstruction process through their work. Providing an environment where everyone who wishes to and is ready to work can find a job is the fundamental principle of employment policy.

Secondly, employment status and needs vary among disaster victims. We should therefore develop a counseling system which can provide comprehensive one-stop services, including continuous support and livelihood support needed by each victim.

Thirdly, measures should be taken to provide detailed job matching services and vocational training programs and to prevent disaster victims from becoming isolated from society, specifically by increasing the staff at public employment security offices (generally called *Hello Work* offices) and reinforcing collaboration among all parties concerned—private businesses, related organizations, NPOs, municipal and prefectural governments, and the national government. While searching for jobs, disaster victims face an agonizing choice between staying in their hometowns and temporarily leaving them. Some people seek jobs compatible with their health condition or physical strength, or want to work while taking care of their families or acquaintances. Others may have future career plans and may want to spend part of their time engaging in activities to become licensed care workers or to acquire other qualifications. To satisfy these diverse needs, support must be individual, continuous and comprehensive. In this regard, helpful insights may be learned from the initiatives already launched by the government to mitigate social disparities (e.g., prevention of suicide) in line with the concept of *social inclusion*.

The fourth point is to build a mechanism to support local businesses now suffering from damage to their facilities and equipment or from debt burdens but which have the potential to recover, because these businesses are expected to provide employment to job seekers. Creation of special zones for reconstruction and a reconstruction fund will be included in this mechanism.

As the fifth point, in order to create conditions that will entice job-creating businesses into the affected areas, legislative and procedural improvements should be made to relax the requirements for the establishment of new businesses. As mentioned above, local businesses with recovery potential are suffering from damage to their facilities and equipment and/or from debt burdens. In addition to the use of a reconstruction fund and the injection of public money, it is absolutely nec-

essary to secure experts who can make an overall assessment of the recovery potential of local businesses and of their value to local areas. During reconstruction of the affected areas, a temporary government-led investment fund should be established in Sendai (named, for example, East Japan Reconstruction Organization), so that the reconstruction fund and experts can operate at full capacity. On the other hand, making procedural improvements in addition to addressing legislative issues will be exceedingly important in the creation of special zones for reconstruction. In this respect, measures should be taken to attract businesses into the affected areas by, for example, reducing corporation taxes and streamlining various procedures.

As the sixth point, projects undertaken to rebuild local communities should actively recruit local residents in the affected areas. The implementation of business-related projects requires the use of funds and know-how available in the private sector in addition to public funds. Local residents should play the leading role in the reconstruction process. Accordingly, promoting community development corporations organized by local residents will be a key factor in employment policy. The rebuilding of local communities needs to be carried out by applying private funds and labor and taking into account the circumstances specific to the respective communities.

The seventh point is to enhance vocational training programs so that disaster victims can acquire the specialized skills and knowledge necessary for reconstruction work, with the goal of providing greater employment opportunities, mainly in the construction industry, in response to the labor demand for reconstruction projects in the affected areas. I presume that there will, for the time being, be many employment opportunities in this industry, including jobs such as debris removal and the construction of new houses and buildings. However, engagement in simple labor will not stabilize the daily lives of disaster victims. They need to acquire advanced skills and knowledge, such as those required to operate heavy equipment and conducting safety management at the construction site. In this respect, it is important to increase the number and size of vocational training organizations where disaster victims can receive training and acquire the necessary capabilities.

The eighth point is to move forward incrementally with the *Japan As One* Work Project—an inter-ministerial, comprehensive project—to promote employment and job creation in the post-earthquake period.

The ninth and final point is that funds should be fully prepared to implement employment measures, not only focusing on employment insurance premiums but also including such funding in the general national budget. Employment measures cannot be put into practice without money. At present, employment insurance is mainly used to finance subsidies for lay-offs due to employers' economic reasons, and unemployment benefits provided under the special measures to cope with disasters. However, employment insurance is inadequate to address the impact of the

reduction in business due to government requirements, such as business cessations due to power consumption restrictions anticipated this summer. It is an urgent task to secure funds, including funds from the general national budget, for the implementation of all-inclusive employment measures.”

Except for the idea of creating a government-led investment fund in Sendai, mentioned as the fifth point above, I think most of my recommendations have materialized in one way or another.

III. Facing the Danger of Lack of Funding for Employment Measures

The primary means of coping with an employment emergency is to provide government subsidies for employment adjustments. In the first supplementary budget for FY2011, as much as 726.9 billion yen was allocated to employment adjustment subsidies for lay-offs due to employers’ economic reasons. Under this special measure, the requirement for receiving subsidies was relaxed and employers were able to receive subsidies for up to an additional 300 days of business cessation during a one-year period, irrespective of the period of their business cessation prior to the earthquake. Employers were also able to receive subsidies for the payment of allowances or wages to workers insured for a period of less than six months.

What mattered more than anything was finding money. The employment stabilization fund for employment insurance services diminished considerably due to emergency expenditures following the collapse of the Lehman Brothers in the fall of 2008. The balance of the employment stabilization fund amounted to 1,026.0 billion yen in FY2008, but due to the expenditure of 1023.5 billion yen FY2009, it fell to less than one-half of this—504.8 billion yen—even after revenues were added. As a result of the further expenditure of 1242.0 billion yen in FY2010, there was only 56.3 billion yen left at the time the initial budget was made for FY2011. Thus, the funds available at that time were completely inadequate to fully respond to the rapid increase in applications for employment adjustment subsidies after the earthquake.

In order to cope with this critical financial situation, the necessary funds to cover the expenses related to employment stabilization services were transferred from the funds for unemployment benefits on a temporary basis. For proper implementation of employment policy, it is a pressing issue to rebuild the financial base of employment stabilization services and human resources development services.

In addition to the necessity of providing subsidies to business establishments in Iwate, Miyagi, and Fukushima, in early May 2011, the possibility of large-scale business cessation due to restrictions on power consumption scheduled for the summer of 2011 within the entire Tokyo Electric Power Company (TEPCO) service area became a concern. Employment

adjustment subsidies are intended to be an emergency measure in the event of lay-offs due to employers' economic reasons, and temporary business cessations due to a government order are not covered by employment adjustment subsidies in principle. In light of the involvement of the national government, which forced local businesses to evacuate from areas affected by the nuclear power plant accident, it is reasonable to pay subsidies to them from the general national budget. However, as it became difficult to formulate the second supplementary budget before the summer, when the severe power shortages were anticipated, there were concerns about securing funds for employment measures to cope with the likelihood that many local businesses would be forced to cease operations.

Prospects for avoiding this concern began to appear as early as at the end of June. The major positive factor was that the amount of the power consumption cut that would be required of large power consumers (business entities) was lowered from 25% to 15%. In addition, it was expected that many manufacturers would be able to continue production by changing their operation schedules to avoid having to cease operations.

When the need for emergency employment measures arises, the first priority is to secure the necessary funds promptly and flexibly. Before a crisis occurs, we must study and establish a mechanism and rules for this purpose. This is one of the lessons learned in relation to employment policy from the experiences of the so called Lehman Crisis, that is the financial meltdown occurred in September 2008, and the Great East Japan Earthquake.

IV. Employment Policy Advocated in the Council's Report, Entitled "Toward Reconstruction—Hope beyond the Disaster"

On June 25, the Reconstruction Design Council in Response to the Great East Japan Earthquake, submitted its recommendations to the Prime Minister in a report entitled "Toward Reconstruction—Hope beyond the Disaster."

In Chapter 2 of the report, entitled "Restore Life and Livelihood," the section under the heading of "(4) From Emergency Employment to Employment Restoration" concretely describes post-disaster responses and employment measures focused on recovery. This section is composed of two parts, "(i) Employment measures for the immediate period" and "(ii) Creating full-fledged employment through industrial promotion."

The first part of the section, "(i) Employment measures for the immediate period," states as follows:

"First, the employment crisis in the disaster region must be addressed with urgency. People who have lost their jobs should be able to swiftly receive unemployment benefits. In light of the severe employment situation in the disaster region, it is necessary that the criteria for receiving unemployment benefits continue to be eased, including the relaxation of the job separation requirements and an extension

of the period for receiving unemployment benefits.

At the same time, in order to enable businesses faced with difficulties maintain employment as much as possible, flexible practices are necessary, including the relaxation of the criteria for employment adjustment subsidies. Furthermore, in order to not only maintain existing employment opportunities but also create new employment opportunities, programs of the job creation business fund and the like should also be actively utilized.

Also, attention needs to be given to ensure that the jobs created through reconstruction programs in the affected areas lead to definite employment opportunities for the disaster victims. To this end, it is vital that the municipalities engaged in reconstruction programs and the “Hello Work” employment security offices share information and fully work together. Furthermore, in order to increase employment opportunities for the disaster victims, the Government is encouraged to subsidize companies which have recruited disaster victims. The Government is also called upon to secure jobs as well as offer detailed job-hunting assistance according to the qualities of the job seeker, through the *Japan as One Work Council*, among other opportunities. Furthermore, the knowledge and skills necessary for job-hunting must be acquired, and vocational training for career changes needs to be enhanced. To ensure that the jobs offered by employers match the jobs sought by disaster victims in a smooth fashion, efforts need to be made to strengthen the functions and system of Hello Work and enhance the matching functions of the “Shigoto-Johonet”, the Job Information Net.”

The immediate employment measures advocated here may be understood to confirm the measures already put into effect based on the first supplementary budget and to point out the necessity of carrying out these measures continuously for a certain period of time.

The other part of the section, “(ii) Creating full-fledged employment through industrial promotion,” lays out an ideal form for industrial promotion and employment during the period from the restoration phase to the reconstruction phase. First of all, it proposes taking advantage of the respective regions’ unique characteristics in carrying out industrial promotion and the introduction of new industries, such as the renewable energy industry. To achieve this, it states that measures should be taken to prevent local companies with recovery potential from withdrawing from business in such ways as solving their overlapping debt problems, and also points out the importance of attracting businesses into the affected areas.

The Study Group’s workshop also discussed one possible approach for the creation of new industries and the attraction of businesses into the target areas: the subsidy for job-creating, low-carbon industries, implemented by the Ministry of Economy, Trade and Industry (METI) in 2010. This subsidy was granted to cover one-third of the new capital investment (or half of such investment for SMEs) for the establishment of new green tech-

nology business sites with high growth potential (e.g., lithium-ion batteries, LED lighting, environmentally-friendly vehicles (*eco-cars*), solar cells). According to METI, this subsidy program, then called “Kan’s Subsidy,” had induced investment amounting to 670 billion yen and created jobs for 112,000 persons. As this subsidy was granted to employers on the condition that they maintain employment for at least four years, it was expected to basically contribute to sustained employment. If this subsidy is applied to the establishment of business sites in the affected areas under more preferential conditions, and is combined with the creation of special zones, it will lead to job creation.

Industrial promotion necessarily requires the advancement of industries, namely agriculture, forestry and fisheries. Accordingly, *sextic industrialization* (the creation of new businesses through the integration of primary, secondary and tertiary industries), as well as the development of human resources through enhanced vocational training, will be necessary. In this context, the Council focuses on in-house training programs provided by companies, in addition to enhancing public vocational training. Developing an employment system through inter-generation collaboration—such as an approach to employment restoration in which people from all generations participate and valuable skills and knowledge are passed on from older to younger workers—will encourage elderly people to work toward reconstruction.

V. Extending Unemployment Benefits

One of the tasks which required urgent action immediately after the earthquake was meeting the needs of people directly damaged by the earthquake and tsunami who had to take leaves of absence from work or who lost their jobs. Under the Labor Standards Act, employers are not liable to pay an allowance to laid-off workers if the lay-offs were due to causes not attributable to the employer, such as damage to facilities and equipment caused by an earthquake or tsunami. The employment adjustment subsidy system is an insurance scheme that relies on the solidarity of employers to help each other rebuild their business operations after temporary lay-offs due to economic reasons. Therefore, lay-offs arising directly from natural disasters and not due to employers’ economic reasons are not covered by this subsidy system. This means that employment adjustment subsidies were not available in response to lay-offs by employers who were forced to cease operations at business establishments within areas designated as restricted due to the nuclear power plant accident in Fukushima.

To cope with this situation, based on the special provisions for employment insurance upon the designation of the earthquake as a severe disaster, unemployment benefits were paid to disaster victims who were unable to receive wages. More specifically, workers who were laid off and unable to receive wages due to a business cessation at a workplace directly damaged by the earthquake or tsunami were made eligible to receive unemployment bene-

fits even where they did not completely leave their jobs. Furthermore, unemployment benefits were available for workers who belonged to businesses located in the designated areas under the Disaster Relief Act, if they were temporarily forced to leave their jobs but were to be re-employed when the employer resumes business.

With regard to employment insurance, additional special measures were taken to further extend the existing 60-day extension by another 60 days (individually extended benefits).

However, in the summer of 2011, there was additional concern that most of the extended employment insurance benefits would expire in succession during the period between the end of 2011 and the beginning of 2012. According to a rough estimate by the Employment Insurance Division of the MHLW as of the summer of 2011 based on the prescribed duration of the benefits, some 30% of unemployment benefits would be exhausted by the end of 2011 and approximately another 30% would be exhausted by the end of March 2012. There was a risk that a large number of people without income would emerge, unless those receiving unemployment benefits successfully found jobs by the time their benefits were exhausted.

In light of this situation, the government made the decision to extend benefits by another 90 days in the coastal areas of the three affected prefectures (wide-area extended benefits). I remember that, during the Study Group's meetings in June, there was a strong sense among the members that wide-area extended benefits were unlikely to be used, because employment policymakers were greatly concerned that further extensions of employment insurance benefits might prolong workers' separations from employment and de-motivate them from finding jobs.

In fact, opinions were divided between supporters and opponents of the three benefit extensions implemented even in the affected areas. Repeated extensions may have been welcomed by unemployed people who had been failing to find jobs despite their best efforts. At the same time, employers desperately seeking to resume their business activities and who were placing jobs offers but failing to secure employees might have seen these extensions to be impeding their recruitment activities. However, I assume that the recognition that many people were still having difficulty finding jobs despite the gradually improving employment situation and the comparatively ample reserves for unemployment benefits led the government to decide to extend benefits three times.

However, no further extensions would be affordable under the existing system. In the future, it will be necessary to reinforce measures to promote employment among the long-term unemployed in the affected areas by providing them with greater opportunities to find jobs through reconstruction promotion projects and by enhancing organizations that can provide public vocational training.

VI. Expectations for and Limits of the Job Seeker Support System

Before the decision had been made to grant wide-area extended employment insurance benefits, the job seeker support system to be put into effect concurrently with the extension (on October 1) attracted attention as a measure expected to achieve employment of a large number of disaster victims whose unemployment benefits would soon be exhausted.

The job seeker support system is a new system launched under the Act on Support for the Employment of Specified Job Seekers through Implementation of Vocational Training (promulgated on May 20, 2011). It is a permanent version of the emergency human resource development support program, generally referred to as the funded training program, launched in July 2009 to respond to the rapidly worsening post-Lehman Crisis employment situation, in anticipation of the unemployment of a large number of non-standard workers.

The job seeker support system that carries out the funded training program is designed to ensure stable employment of unemployed persons who are ineligible for employment insurance, by providing them with (1) vocational training free of charge, (2) financial assistance to facilitate their participation in vocational training if they meet the prescribed requirements (in terms of their individual or household income, assets, etc.), and (3) vigorous support for their job-hunting activities via public employment security offices. Persons eligible for this support system include workers who were ineligible for employment insurance, those who were unable to receive employment insurance benefits as a result of not having been insured for a sufficient period of time, and those whose employment insurance benefits have been terminated, as well as new graduates who have yet to find jobs and self-employed persons and their families who have been forced out of business.

In contrast to the funded training program, the job seeker support system places more importance on improving job seekers' success in finding employment. Training is provided by private vocational training organizations accredited by the Japan Organization for Employment of the Elderly, Persons with Disabilities and Job Seekers (JEED). Accredited training organizations are provided with 50,000 yen per trainee on a monthly basis (accredited training subsidy). There are two categories of training: "basic training" and "practical training." For practical training, training organizations are awarded 10,000 to 20,000 yen per trainee in proportion to the rate of employment achieved, as an incentive to help trainees succeed in finding jobs. This system also provides vocational training benefits for trainees: 100,000 yen per month during the three- to six-month training period, if they meet certain requirements (individual income of 80,000 yen or less or household income of 250,000 yen or less per month).

If this system works well in the affected areas, it will provide those whose unemployment benefits have been exhausted and those not covered by employment insurance (e.g. part-time workers and self-employed persons who have been forced out of business) with opportunities to participate in training and find employment. The job seeker support

system was dubbed a “second safety net” for employment and was expected to prevent those ineligible for employment insurance from becoming dependent on public assistance and to lead them back to employment.

However, we must not have excessive expectations for the effect of the job seeker support system in its current state on increasing training opportunities and securing human resources for the reconstruction process in the affected areas. This is because, firstly, the adequacy of training opportunities within the whole area of a prefecture does not mean that sufficient opportunities are available in every city, town or village. It is difficult, in reality, to commute to urban areas where training opportunities are concentrated from surrounding areas affected by the disaster, as it takes substantial time to travel by train or car from most such areas. In addition, job opportunities are limited in the affected areas even for those who finish training courses for jobs which apply skills acquired through training, except in some industrial sectors, such as construction and nursing care services.

We should also pay attention to the fact that pushing training organizations to ensure the success of job seekers in finding employment could have a negative effect as well. This idea was derived from criticism of the funded training program, which argued that inefficient training organizations survived because they were not under strong pressure to achieve successful results. On the other hand, the job seeker support system assures the quality of training to a certain degree, but at the same time creates a risk of excluding people experiencing greater difficulty in finding jobs from training. Such people include the long-term unemployed, elderly people, self-employed people who have been forced out of business, and women who can work in limited areas because of their duty to take care of their families. Thus, there is a concern that this system raises the issue of *cream skimming*; that is, training organizations preferentially selecting trainees who have a greater potential to find jobs after finishing their training.

In order to tackle these challenges, it is necessary to reform the current job seeker training system. For example, people who participate in intensive training for a certain period of time far from the affected areas should be provided housing support (by housing them in employment promotion housing, public housing, and Urban Renaissance Agency rental housing) in addition to receiving benefits. In order to ensure that trainees are able to find jobs in the affected areas, it is also important to develop job offerings in line with the types of the training they receive.

As of January 2012, staff members working for the affected prefectures’ public employment security offices were responsible for a large number of active job seekers. In Iwate, each staff member was responsible for 512 persons; in Miyagi the number was 776 persons and in Fukushima, 724 persons. Despite the efforts of the prefectural labor bureaus to recruit additional counselors, the average number of active job seekers per staff member / counselor in these prefectures remains large at 63 persons. Since smooth implementation of the job seeker support system requires the active involvement of public employment security offices, sufficient staffing is required to develop job offerings.

One possible solution to the issue of cream skimming may be to revise the existing amount of the accredited training subsidy—50,000 yen per trainee—which is uniformly applicable to all trainees, and make it a variable amount depending on the trainee's level of difficulty in finding jobs. More specifically, it is recommended that guidelines for determining trainees' relative levels of difficulty in finding jobs be formulated, according to factors such as their periods of unemployment, ages, academic records, and vocations. An incentive-based system should then be designed wherein training organizations would be paid a larger subsidy for successfully enabling a trainee with a higher level of difficulty to find a job.

The current job seeker support system is effective to some extent in helping unemployed persons who do not receive employment insurance benefits but who are very likely to find jobs quickly if they finish training and acquire additional skills. On the other hand, in order to help people who face difficulty in finding jobs or who are unwilling to be trained, the system should be refined to induce greater effort by trainees and training organizations. The first statutory review of the job seeker support system is scheduled to take place three years after its initial enforcement date. However, flexible and prompt action should be taken before that by budgeting additional subsidies or issuing notices as appropriate. Furthermore, given the impact of the Great East Japan Earthquake, which had not been anticipated at the time of the support system was codified, it may be appropriate to revise and refine the system before the scheduled review, if necessary.

VII. Putting the Brakes on the Increase in Public Assistance Recipients

The ideal form of reconstruction may vary depending on the circumstances in the affected areas, but the situation that must be avoided from a medium and long-term perspective is the same: a rapid increase in the number of public assistance recipients resulting in a labor shortage for reconstruction work in an area, which also de-motivates disaster victims from taking part in the reconstruction process.

In all three heavily damaged prefectures (Fukushima, Miyagi, and Iwate), the ratio of public assistance recipients among the general population was below the national average before the earthquake. As of March 2011, there were 11.3 public assistance recipients per thousand people in Iwate, 12.1 per thousand in Miyagi, and 9.5 per thousand in Fukushima, while the national average was 15.9 per thousand. However, coupled with the aging of the population in these prefectures which had been occurring before the earthquake, an exodus of young people has occurred that has yet to end, thus making it more difficult for elderly people to earn a living. Furthermore, I presume that the number of families in need of a childrearing allowance has also increased, because many families lost their primary income earners in the earthquake.

There is a concern that the ratio of public assistance recipients will rapidly increase in

the affected areas unless appropriate measures are taken. Another challenge of reconstruction is to create an environment in which everyone who is ready and willing to work is able to find a job and earn a living irrespective of age, gender or any other factor.

The job seeker support system is unlikely to encourage people who temporarily need public assistance to find jobs, because it provides vocational training benefits to people with monthly incomes of 80,000 yen or less, and as such would not encourage people who receive more in public assistance to voluntarily undergo training. In the first place, the job seeker support system targets only those with the motivation to work and does not seek to cover people who are not enthusiastic about seeking jobs.

To rectify the current situation, it is advisable to design a new system wherein public assistance recipients see some benefit to training. For example, if they are able to receive a larger amount in assistance when they take accredited training than when they do not, they would be more motivated to take training. Furthermore, if public assistance were not entirely stopped when a recipient finds a job after training, but rather continues to be provided to some degree, enabling a public assistance recipient to earn a larger amount in total income, he/she would make a greater effort to find a job.

The government has not been indifferent to promoting the shift from public support to independence through employment. Various support programs have been implemented in response to many recommendations to enhance employment support for public assistance recipients. For example, an agreement has been reached between local governments and the public employment security offices. Then the local governments will request employment support from public employment security offices based on information reported by welfare service offices dealing with people in need of such support, including public assistance recipients, childrearing allowance recipients, and housing allowance recipients, as well as people having difficulty finding employment or making a living. Under this agreement, public employment security offices have employment support counselors work out support plans in line with the needs of such people and their living environments. A wide range of support programs are provided by these offices, from on-site counseling and other career consulting services to job preparation programs, trial employment, career building through public vocational training, job counseling and job placement, development of individual job offerings, and follow-up programs for adaptation to workplaces.

According to the MHLW, as a result of initiatives to promote employment and adaptation to workplaces under the Support Program for the Shift from Public Support to Independence through Employment and the Employment Support Program for Public Assistance Recipients, both the number of support recipients and the number of jobs they found increased from 13,288 persons and 7,153 jobs in FY2008, to 21,139 persons and 12,597 jobs in FY2010, nationwide. Although I was unable to obtain information concerning the status of the implementation of the Support Program for the Shift from Public Support to Independence through Employment in the affected areas, I worry that local governments and public employment security offices may have been too busy to establish cooperative rela-

tionships to carry out support programs or that their cooperation might have failed to fully succeed. If this is indeed the case, detailed individual support programs should be further enhanced by taking such action as assigning a sufficient number of staff members (e.g. support counselors) to public employment security offices.

VIII. Utilizing Fund Projects

Employment restoration in the affected areas requires the creation of new job opportunities. From this viewpoint, the Post-Earthquake Response Project (to create job opportunities for workers affected by the Great East Japan Earthquake) was launched and has been carried out in combination with other employment-related projects implemented since FY2009, namely the “Priority Area Job Creation Project” (to create job opportunities in areas with high potential growth, such as nursing care and medical care services, the environment, etc.) and the Human Resource Development Project. The first supplementary budget for FY2011 allocated 50 billion yen for the new project. These job creation projects are incorporated into the Emergency Job Creation Project Special Fund set up in each prefecture, and are outsourced to private businesses or NPOs or carried out directly by local governments. The Post-Earthquake Response Project covers various types of work, such as clean-up work in the affected areas (e.g., removal of debris and recovery of fishing tools that have washed away), planting for community development, assisting work at municipal offices, and patrolling for security in evacuation shelters and other places in the affected areas.

The Job Creation Fund was originally set up in FY2008 as one of the “Measures to Support People’s Daily Lives,” to be carried out in the form of the Hometown Employment Revitalization Special Fund. This fund had its greatest effect by financing the Emergency Job Creation Project launched in response to Lehman Crisis in the fall of 2008. In FY2008 and FY2009, 450 billion yen was expended from the fund as grants in relation to project plans formulated by prefectural and municipal governments. The grants were used to encourage private businesses to hire job seekers, with the goal of flexibly creating jobs.

The Job Creation Fund Project started to play a significant role in improving overall employment trends at a relatively early stage after the earthquake. The progress report of the *Japan As One* Work Project states that about 26,000 persons found jobs in the three affected prefectures through the Job Creation Fund Project (as of January 16, 2012). Along with the utilization of employment adjustment subsidies, this fund project can be appreciated as having achieved some positive results in response to rapidly changing employment trends affected by Lehman Crisis and the Great East Japan Earthquake.

Another job creation measure, the subsidy for employment development for disaster victims, was also set up and 6.3 billion yen was allocated to it in the first supplementary budget. This subsidy was to be granted to businesses that hired disaster victims (500,000

yen per person for large businesses and 900,000 yen per person for small and medium-sized businesses). As of December 2011, 887 businesses had been selected to receive the subsidy.

For the purpose of achieving complete employment restoration in the affected areas, the government decided to launch a new project—the Employment Restoration Promotion Project—backed up by the third supplementary budget for FY2011. This is a two-pillar project consisting of the “Business-based Job Creation Project,” which focuses on job creation along with industrial revitalization, and the “Job Creation Project for Everybody,” which aims to create independent businesses through the transmission of knowledge and skills from older to younger workers, active recruitment of women and persons with disabilities, and promotion of community-based work styles. Support will be provided under these projects for up to three years, until FY2015.

With regard to temporary employment of workers as assistants at municipal offices, implemented as an emergency stopgap employment measure, a sensitive issue is how long such employment should be maintained. Temporary measures taken by local governments to directly hire persons who were engaged in agriculture, forestry or fisheries independently may be somewhat effective in enabling those persons, who are not covered by employment insurance, to earn an income. However, such measures should be implemented only on a temporary basis, because they will hinder self-sustaining reconstruction if they are continued without limitation. When making use of fund projects, local governments are required to maintain an appropriate balance between providing security with a minimum standard of living through direct employment and self-sustaining reconstruction led by the private sector.

Nevertheless, it is very likely that flexible and prompt action in setting up and utilizing the fund projects has been successful in preventing a larger increase in the unemployment rate in the face of events with the potential to cause unexpected and rapid worsening of the employment situation, such as Lehman Crisis and the Great East Japan Earthquake. Fund projects have the advantage in terms of flexibility and convenience, but at the same time, they have the disadvantage that their purposes and effects are not always verified completely. Strict data-based scrutiny should be applied in the assessment of fund projects.

IX. Providing Support on a Group Basis or Individual Basis

Immediately after the occurrence of the earthquake, the economic problem of “supply chain disruptions” attracted attention. Today, companies throughout the country, particularly those in the automobile and electronics industries, are linked by complicated supply chains, and a risk emerged that the damage in the Tohoku region would not only result in the stagnation of one regional economy but could have a serious negative impact on production and distribution mechanisms throughout the country.

In light of this situation, the government, under the aegis of the Small and Medium

Table 2. Concentration Ratio of Job Creation

Annual net increase in the number of regular employees newly hired per establishment	Job creating sector		
	Proportion to all establishments (%)	Proportion to all jobs created (%)	
		Net	Cumulative
25 or more	0.9	18.6	
10–24	2.0	18.0	36.7
5–9	3.8	15.4	52.1
3–4	5.9	20.8	72.9
1–2	17.3	27.1	100.0

Source: From the findings in the joint research by Professor Hiroshi Teruyama and the author, based on the 2002 Survey on Employment Trends (MHWL).

Enterprise Agency, fully implemented the “Subsidy Project for Restoration and Construction of Facilities and Equipment by SME Groups,” which aims to support groups of SMEs damaged by the earthquake. Specifically, under this project, a group of SMEs or industrial cooperatives in an affected area formulates a recovery project plan, and if this plan is approved by the relevant prefectural government, a subsidy will be granted to the group from the supplementary budget to cover the costs of restoration and construction of facilities and equipment.

Starting in August 2011, the selection process was carried out three times. Project plans amounting to 206.4 billion yen were selected and subsidies were granted to 172 groups in total. The results of the first selection in August show regional characteristics; in Miyagi, most applicants were SME groups engaged in manufacturing which integrate important local businesses, such as a group forming an electronic component supply chain, whereas in Iwate, groups engaged in marine product processing accounted for a large share.

It may be extremely important to verify to what extent subsidies for these SME groups contributed to creating jobs. The precedent studies on job creation suggest that providing intensive support to individual enterprises is more effective in job creation than providing support on a group basis.

Table 2 presents an extract from the findings of the research on the job creation concentration ratio, which I carried out jointly with Professor Hiroshi Teruyama of Kyoto University. Specifically, the table indicates the percentage of business establishments which hired new employees in 2002, organized by the amount of the increase in number. 17.3% of the business establishments—the overwhelming majority—hired one or two new employees within one year. However, the degree to which establishments which hired only one or two new employees contributed to overall job creation nationwide was rather small, at 27.1%.

What is shocking about this table is the fact that only a very small number of estab-

lishments amounted to a large share of the total job creation. Establishments that hired 25 or more new regular employees annually accounted only for 0.9% of all establishments, but the share of the overall jobs created by these establishments was as large as 18.6% of the total job creation. Furthermore, establishments that hired ten new employees or more annually, which accounted only for 2.9% of all establishments, brought about 36.7% of the total job creation.

Another analysis also suggests that job creation is concentrated at certain enterprises. The 2011 White Paper on Small and Medium Enterprises in Japan states that approximately 50% of all jobs created between 2002 and 2007 were created by only about 7% of all enterprises nationwide. The white paper calls such enterprises with job creation potential “gazelles,” an agile animal with the ability to jump very high, according to the American economist David Birch.

These findings give us hints as to how we should promote job creation, at least quantitatively. If support is provided to many enterprises with lower job creation potential, the positive effect arising from such support will be limited. However, providing intensive support to some enterprises with high growth potential will lead to creating jobs on a larger scale.

Development of an environment conducive to sustainable job creation is a big challenge not only in the post-earthquake period but also for the future of this country. Which is more effective in job creation: the group-based support adopted as a post-earthquake measure or intensive support for some select enterprises? We should explore the best job creation policy for the future from this viewpoint, while at the same time taking the progress of the reconstruction project into account.

X. Conclusion

One year after the occurrence of the earthquake, the overall employment situation in the affected areas is now recovering. The ratio of job offers to job seekers in the three affected prefectures stood at 0.48 in March 2011. It exceeded this level in June 2011 and continued to rise thereafter, finally reaching 0.78 in January 2012. According to the Labor Force Survey (Ministry of Internal Affairs and Communications), the unemployment rate in the Tohoku region in the period from October to December 2011 fell 1.0 point below the previous year’s level. In contrast to the fact that the index of improvement in the unemployment rate for Japan as a whole during the same period declined 0.5 point from the previous year, the employment recovery in the Tohoku region is outstanding.

An important research task for the future may be to closely analyze and capture the effects of the policy measures implemented thus far on the employment recovery in the affected areas. To achieve this, it is necessary not only to focus on employment achieved directly through employment policy, but also to take into account the secondary job creation

effect. At the same time, negative effects should also be studied, such as the impediment public employment projects present to job creation by the private sector, generally called “*crowding-out*,” and the deterioration of the employment situation due to the exodus of the labor force.

Strict policy evaluation studies require the accumulation and utilization of adequate data. In light of the differences among municipalities in terms of the impact of the earthquake and the progress of their reconstruction processes, we will have to wait until the Population Census scheduled for 2015 to conduct a detailed regional comparison. Meanwhile new questions concerning the impact of the earthquake on employment have been added to the Employment Status Survey scheduled for the fall of 2012. Specifically, the survey will ask questions, on a municipal level, such as whether the respondents lost their jobs, were laid off, or were evacuated from the affected areas due to the earthquake, and whether they have changed residences since the earthquake. As this survey will target about one million people nationwide, it is expected to provide useful reference data to verify the impact of the relevant policy measures.

We should not be overly optimistic despite the fact that employment in the affected areas is recovering. The increase in new job offers is largely due to the construction industry which is rapidly revitalized by public expenditures for reconstructing infrastructures while it has been experiencing chronic job losses since the late 1990s. However, partly due to the previous low demand in this industry, there is currently an insufficient number of experts equipped with advanced skills or licenses as well as companies engaged in the construction business to meet the demand for construction work. Considering that reconstruction subsidies, which finance reconstruction projects, are to be granted only for a limited period of time, it is unrealistic to expect that the current construction boom will last over the long term. The future of employment in the affected areas will depend on whether we can create and maintain groups of enterprises which can serve as regional cores, rather than relying only on construction-related sectors.

Despite overall improvement in the employment trends, the situation remains severe for women, elderly people, entrepreneurs who have been forced out of business, and people without higher education. It is hoped that support will be provided for these types of people on an individual, continuous and comprehensive basis, while clarifying the background factors that bar them from finding jobs.

What we should keep in mind as the lessons from the experience of Lehman Crisis in the fall of 2008 and the Great East Japan Earthquake in 2011 is that we should build an employment system capable of reviving in the face of the rapid and large-scale deterioration of the employment climate. We should begin studying at all levels, including the national and local government level, private enterprises, cooperatives, and individuals, what such a resilient employment system would look like.

The Great East Japan Earthquake and a Future Vision for Labor Law in Japan

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This paper discusses a future vision for the labor law system in Japan, while taking into account the situation after the Great East Japan Earthquake. Upon the occurrence of the earthquake, the government took emergency measures which may have been inadequate, but which have been effective to some degree in preventing the labor market from rapidly plunging into turmoil and in maintaining employment to the greatest possible extent. However, these measures were based on the conventional type of employee insurance system, and it would not be advisable to use the same approach in the future. Japan had been experiencing an increase in the number of non-standard workers even before the earthquake, as well as a gradual decrease in the total number of employed persons, and it has also been under pressure to achieve an appropriate work-life balance for its workers. In view of these circumstances and in order to establish a labor law system in anticipation of large-scale natural disasters, increasing opportunities to work to the greatest extent possible is a critical task. To achieve this, the government should firstly provide non-standard workers with opportunities to develop their careers and undergo vocational training, and offer them opportunities to work other than as company employees, such as at NPOs or workers' cooperatives. Secondly, the government should strengthen the secondary labor market as a foothold to stable employment, and should consider improving the support system for job seekers and establishing a labor contract system.

I. Labor Policy after the Great East Japan Earthquake

1. Measures Taken by the Government Immediately after the Earthquake

The earthquake and tsunami that occurred on March 11, 2011, caused enormous property damage and loss of life. Emergency employment and labor policy measures were required to cope with the problems faced by workers, such as harm caused to their lives and health and that of their families and damage to their residences, not to mention the loss of employment and wages due to damage to their workplaces. Employers were also directly or indirectly affected by the disaster, and some were forced to cease operations or experienced difficulty due to damage to their parent or affiliated companies. These circumstances had a great impact on their treatment of workers.

It should be noted that the government took measures as quickly as it could in response to this unprecedented crisis. The Ministry of Health, Labour and Welfare (MHLW) issued nearly 20 notices in rapid succession on the very day that the earthquake occurred, requesting support and rescue for persons in need of care, elderly persons, and persons with disabilities. The MHLW instructed the authorities concerned to extend the payment terms of

social security contributions for disaster victims, clearly showing consideration for people in need of special attention. The MHLW also quickly took necessary measures in the field of employment and labor policy, such as instructing prefectural labor bureaus to promptly and flexibly handle applications from affected workers for industrial accident compensation insurance benefits (Notice of the Labour Standards Bureau, Worker's Compensation Department, Compensation Division, No. 9).

The MHLW issued another notice on March 17, entitled "Special Measures Concerning Employment Adjustment Subsidies in Response to the Occurrence of the Great East Japan Earthquake" (Notice of the Employment Security Bureau, No. 2), in which it provided special measures concerning the payment of government subsidies for employment adjustments by employers in the affected areas. Then, after expanding the scope of employers covered by the special measures by way of its notice dated April 5 (Notice of the Employment Security Bureau, No. 16), the MHLW further issued notices and instructions in order to take the best measures while giving due consideration to the interests of those affected by the disaster, in terms of the payment of employment insurance benefits, industrial accident compensation insurance benefits, unpaid wages (which were temporarily paid by the government on behalf of employers), and public assistance benefits, as well as the overall application of the Labor Standards Act and the Labor Contract Act.¹ The MHLW compiled all of the information on the measures taken in response to the earthquake and made it available to the public on its website (*Information on the Great East Japan Earthquake*), with the aim of promoting the comprehensive and functional use of such information.

The abovementioned efforts made by the government deserve appreciation as emergency measures at least, and there is no doubt that they prevented the employment situation in the affected areas from becoming more serious to some degree.

However, the outcomes of these measures demonstrate the limits of what could have been done by the government at that time. The first limit, the counterpoint of the abovementioned benefit, is that none of the measures taken after the earthquake represented drastic or extensive policy developments, and were rather policy measures which had already been available and which were enhanced only by increasing the speed of their implementation or their scope. For instance, the relaxing of the requirements for employment adjustment subsidies and the expansion of their scope may have been temporarily effective in preventing turmoil in the labor market, but the employment adjustment subsidies should not have been used as a major countermeasure as their future reduction or elimination had been previously discussed. In addition, extensions for the payment of social security contributions reduced the burden on affected workers, but given that claims for employment insurance benefits increased in the post-earthquake period, this action reduced the funds available for benefits and placed further strain on the national treasury, further worsening the national fiscal situa-

¹ Nogawa, *Q&A Shinsai to koyo mondai* [Questions and answers: Earthquake and employment issues] (Tokyo: Hoji Homu, 2011), 219ff., provides a list of these notices and instructions issued by the government.

tion.

In addition, government agencies were also damaged by the disaster and were unable to take the systematic measures they had intended to. In fact, the disaster hit labor standards bureaus, public employment security offices (generally called *Hello Work* offices) and other entities in charge of labor administration located in the affected prefectures in the Tohoku region, compelling them to rely on support from the relevant agencies in the surrounding areas. As it was naturally anticipated that there would be limits to what the government agencies could do to cope with the situation, the private sector should have played a leading role in helping affected workers. However, due to the lack of a system that could help NPOs provide support efficiently and effectively, the large number of volunteers who headed for the affected areas individually or in groups were unable to function satisfactorily and were unable to effectively complement the limited measures taken by the government.

2. *Japan As One Work Project*

The *Japan As One Work Project*, designed and implemented by the government as a full-scale comprehensive initiative, was a turning point in post-earthquake employment policy. The government held the Conference on the Promotion of Employment Support and Job Creation for Disaster Victims on March 28, which decided on the Phase 1 Countermeasures on April 5, and the Phase 2 Countermeasures on April 27, respectively.

In Phase 1, the conference adopted basic guidelines which provide that disaster victims' employment and lives will be supported by *Japan becoming one*, through the following measures: (i) creating employment opportunities for disaster victims by utilizing the companies and resources located in the affected areas on reconstruction projects; and (ii) helping disaster victims find employment outside the affected areas if they wished while carefully taking the desires of disaster victims and of local areas that accommodate them into consideration. Specifically, the conference adopted the following measures to promote job creation: [1] promotion of reconstruction projects, such as restoration of infrastructure, removal of debris, construction of temporary housing, and repair and rebuilding of homes affected by the disaster; [2] expansion of the "job creation project in priority areas" and the "emergency job creation project," by adding "post-earthquake response areas" to the priority areas targeted in the former project, and by abolishing the one-year limit on the employment period under these projects; and [3] prioritizing the employment of people from local areas by increasing opportunities for local construction companies to receive commissions for ongoing restoration projects and providing incentives in the form of employment subsidies for companies that hire people who have lost their jobs due to the disaster. Secondly, with the aim of building a system to match disaster victims to jobs, the conference decided to [1] enhance the ability to match disaster victims to jobs in the affected areas by expanding the functions of public employment security offices and holding job fairs for disaster victims, and [2] enhance the ability to match disaster victims to jobs outside the affected

areas by securing job opportunities for those engaged in work related to agriculture, forestry, and fisheries and for self-employed workers. Thirdly, in order to maintain and secure employment for disaster victims, the conference advocated [1] expanding the employment adjustment subsidy system by broadening the scope of the special measures from five prefectures to include more areas in need, and by implementing new special measures for businesses located outside the affected areas but with close business relationships with those in the affected areas, and [2] assisting affected students in finding employment by increasing the subsidies for employers who hire them.

The goal of Phase 2 was to implement the countermeasures through budgeting and legislation. Specifically, while moving forward with the countermeasures launched in Phase 1, the conference decided on the following measures: [1] providing additional subsidies (Employment Development Subsidies) for companies that hire disaster victims; [2] strengthening public employment security offices' on-site employment counseling services, and increasing the number of special staff promoting the development of job opportunities; and [3] expanding the employment adjustment subsidy system (granting subsidies for up to 300 additional days of business cessation during the period covered by the special measures; extending the period of the temporary measures [to cover persons insured for a period of less than six months.]

On October 25, the conference laid out the Phase 3 Countermeasures based on the third supplementary budget. Backed up by budgetary measures to support employment recovery, the conference clearly indicated three major goals while setting specific numerical targets: [1] job creation through the revival and reconstruction of local economies and industries (5.7 trillion yen; jobs to be created for 350,000 people); [2] integrated support for industrial development and employment (0.4 trillion yen; jobs to be created for 150,000 people); and [3] training personnel who contribute to reconstruction and support to place disaster victims in stable jobs (0.1 trillion yen; supporting employment for 70,000 people). The specific measures taken to achieve these goals, as decided by the conference, include the following: [1] support for business entities (establishment of a subsidy program for the construction of production bases in growth areas, and continuation and expansion of financial support for small and medium-sized enterprises [SMEs]); [2] support for the agricultural, forestry, and fisheries industries and for the tourism industry (early recovery and reinforcement of agricultural land and facilities and sea ports and fishing grounds, as well as prevention of harmful rumors regarding affected areas); [3] reduction of corporation taxes (creation of a tax system to promote the establishment of new companies by freeing newly established companies from taxation for five years); and [4] extension of the payment of employment insurance benefits (90-day extension implemented in the coastal areas of the three affected prefectures: Iwate, Miyagi, and Fukushima).

Phase 3 is the only phase of the project which presents specific, direct measures backed up by the necessary financial resources. As of January 2012, the conference had the

following outlook with regard to the implementation of these measures.²

In the area of “job creation through the revival and reconstruction of local economies and industries,” 206.4 billion yen had been spent to provide subsidies for the restoration of facilities for common use by SME groups, and an additional 50 billion yen was allocated under the FY2012 budget. Under the program for the construction of temporary stores and other facilities, 201 facilities have been completed (applications have been accepted for 515 facilities). However, the conference did not indicate the budgets allocated or numerical targets in relation to the other measures listed in Phase 3, namely support for agricultural, forestry and fisheries industries, promotion of an integrated community care system, creation of the Great East Japan Earthquake Subsidy, and promotion of projects relating to the environment and new types of energy use. The conference only stated that these measures were under consideration or expected to be implemented by the end of FY2012. In the area of “integrated support for industrial development and employment,” the program for comprehensive employment recovery in the affected areas was expected to create jobs for 5,000 persons by the end of March 2012 and for about 45,000 persons by the end of March 2013 in the three affected prefectures. By increasing the funds for the emergency earthquake, etc. employment program, the conference expected the creation of jobs for 5,000 persons by the end of March 2012 and for about 20,000 persons by the end of March 2013. In the area of “training of personnel who contribute to reconstruction and support to place disaster victims in stable jobs,” the conference stated that public vocational training had already been provided for 12,165 persons in total and would be provided for an additional 6,468 persons during the period between January and March 2012 in the three affected prefectures. Under the program for employment of disaster victims in agriculture, the conference stated that 550 trainees would be selected by the end of April 2012, and through the extension of the program to support the employment of new graduates, support measures would be provided for 2,500 new graduates affected by the disaster by the end of March 2012.

Furthermore, the conference confirmed the results of the unemployment benefit support program implemented immediately after the earthquake and announced the termination of the extension of unemployment benefit payments for affected workers, declaring that it would make every effort to create more jobs by promoting industrial policy measures to revive and reconstruct local economies and facilitate the offering of jobs in restoration and reconstruction projects through the effective functioning of the network of public employment security offices. As of November 2011, 64,232 persons had received unemployment benefits in the three affected prefectures.

² MHLW, “Further Employment Support under *Japan As One* Work Project, and the Outlook for Implementation” (January 20, 2012).

3. Assessment of the Labor Policy Measures Implemented Thus Far, and Issues for the Future

We are unable to make a proper assessment of the labor policy measures that have been implemented in response to the post-earthquake situation only one year after the Great East Japan Earthquake. However, while in the process of developing a new type of labor law system which takes the experience of this disaster into account, we should attempt a tentative assessment of the effects of these comprehensive measures to some extent and explore future options based on this assessment.

From this viewpoint, there is no denying that the implementation of the employment policy projects lacked speed, as described above. As of January 2012, the specific numerical data provided in the government's projections for the measures to be taken under the *Japan As One* Work Project were largely targets for the future, and the achievements up to that time were largely attributed to the expansion of the conventional systems for granting unemployment benefits and employment adjustment subsidies or to the implementation of temporary support measures. This outcome must be said to be far from satisfactory for a taskforce set up as early as March 28, 2011. The total number of jobs expected to be created directly through the project did not even reach 70,000, and other job creation projections were nothing more than qualitative assumptions which relied on the implementation of industrial policy measures or action by public employment security offices. In light of the urgency of the situation—in particular, the fact that the government's estimate of the number of jobs to be created by the end of FY2012 falls below 70,000, although it had announced Phase 1 as early as the beginning of FY2011—, doubts have arisen about the effectiveness of the policy measures.

At the same time, it can be said that a catastrophic effect on the employment situation as a result of the earthquake was narrowly avoided. As would be expected, the total number of active job offers in the three affected prefectures dropped in March 2011 by 8.9% over the previous month, but rose thereafter on a month-to-month basis for almost all of 2011, increasing from 61,290 job offers in March to 106,239 in November. The number of new job offers also dropped sharply in March, by 26.6% over the previous month, but rose rapidly in April by 61.5% and continued to increase in every month except August, finally reaching 43,484 new job offers in November, more than a 100% increase from the level in March (21,578 new job offers). Similarly, the number of job seekers who were successful in finding employment decreased markedly—in March by 40.7% and in April by 19.5% over the respective previous months—but then dramatically increased by more than 20% on average from May through August, reaching 11,864 in November, up by 11.9% over the previous year. We should of course not overlook the fact that the total number of job separation slips, which must be submitted to receive unemployment insurance benefits, reached 204,036 in the three affected prefectures during the period between March 12 and December 18, 2011, 1.5 times the number submitted in the previous year. Even taking this into

consideration, we can at least say that the employment situation remained better than expected, when compared to the situation in other areas, such as housing, medical care, welfare programs, and industrial development.

Thus, although the government-led large-scale project has not been sufficiently successful, employment has been protected comparatively well. This phenomenon demonstrates that conventional employment measures—i.e., the granting of employment adjustment subsidies to maintain employment and the networking of public employment security offices and local agencies to secure employment—have been exceedingly effective. However, the results also lead to the assessment that the new project launched by the government has not even played a role in complementing these conventional measures. It is a valuable finding that conventional measures have proven effective in a crisis of such a scale, but this effect is due partly to the structure of the labor market and the employment environment in the three affected prefectures. Looking to a future in which it may become impossible to avoid similar disasters, we must review the issues found as a result of this project and explore ways of reconstructing the labor law system.

II. Designing a System in Anticipation of Large-Scale Natural Disasters

In the past, the impact of economic fluctuations on employment was studied under the premise that the business cycle is inherent to a capitalist economy. The main objective of employment policy was to realize full employment given the cyclical economic process wherein a boom creates a bubble, which leads to a crisis, and then another boom following the resulting recession. The collapse of Lehman Brothers in 2008 and the subsequent economic situation has had such a serious impact on the global economy that even the risk of a panic cannot be denied. The measures implemented on that occasion in the area of employment also centered on variations on conventional policy measures: reinforcement of the shrinking labor market by maximizing the employment insurance system and increasing employment adjustment subsidies to promote the efforts of individual companies to maintain employment. It is worth noting in connection with the establishment of a new labor law system that the implementation of these measures resulted in the enactment and enforcement of the Job Seekers Support Act, which will be discussed later.³

The structure of the economic fluctuations and the objectives of employment policy will basically remain unchanged for the time being, but given the possibility that an external factor of considerable scale, such as this great earthquake, could cause devastating damage to the employment system in an instant, it goes without saying that we must implement an employment system with some resistance to these kinds of unforeseen events. In particular,

³ The Job Seekers Support Act was created by codifying the emergency human resource development support program (fund-sponsored training program) originally established as a tentative program in response to employment uncertainty after the Lehman Crisis.

Japan is one of the most earthquake-prone countries in the world, and its topographical features—its many volcanoes, as well as its many rivers and the fact that it is surrounded by the ocean—will always carry the risk of various kinds of natural disasters. As is apparent from a report that there is a 70% of chance of a magnitude 7 or larger earthquake occurring in the Tokyo metropolitan area within the next four years, Japan must equip its employment system in preparation for the occurrence of such a disaster.

The question, then, is what employment and labor policy should be formulated. As a prerequisite, in order to respond to the threat of a large-scale unexpected event, the system should be doubly and triply reinforced to ensure that it is capable of mitigating the impact of such an event. For example, a system which protects long-term employment, designed to maintain employment at individual companies to the extent possible, would not work if companies' activities collapse in a chain reaction within an extremely short period of time. Obviously, most of the large number of workers who would suddenly lose their jobs and be thrown out of their workplaces in such an event would not be able to find new employment if they have only acquired skills specific to the companies where they worked. A framework must therefore be built in anticipation of large-scale job losses within a short period of time.

Policy measures in response to such a situation may first of all include encouraging workers to make efforts on a daily basis to acquire universal vocational capabilities which would enable them to find new jobs quickly, enhancing the job market for those who want to change their current jobs, and keeping career paths open to workers to enable them to escape unstable employment. These should be considered preventive measures to be taken in response to the threat of a sudden and rapid shrinking of the labor market. Secondly, providing more opportunities to work other than as company employees, such as helping people find jobs at NPOs, workers' cooperatives, and micro businesses, and facilitating the formation of entrepreneur cooperatives, should also be fully discussed. It will thus be possible to achieve results beyond those possible with conventional labor market policy, by making minor changes to the Japanese social structure, in which most people tend to work as company employees, and thereby offering as many choices as possible. Thirdly, in order to smoothly implement such an employment policy, due consideration must be given to the position of workers in the transitional process. To be more precise, substantial support should be provided for workers during the period of their unemployment, and at the same time, an appropriate process for changing jobs and developing careers must be established. These goals should not be achieved merely by providing employment insurance benefits or temporary monetary benefits but should rather be developed into permanent systems. Furthermore, if the employment environment is sufficiently improved in this regard, more dramatic reforms, such as the establishment of a system to resolve disputes over dismissal with monetary compensation and lifting the ban on concurrently holding two or more job posts, would become possible.

By implementing the policy measures suggested above, the labor market will become more stable and flexible, providing it with a variety of means to absorb excess labor in the

face of a sudden labor surplus.

III. Actual Direction of the Labor Law System Reforms

1. Development of Job Experience and Career Building

The Job Creation Fund was used by the government after the earthquake to directly create new jobs in the affected areas. This fund was to be allocated to the job creation project in priority areas and the emergency job creation project, both of which were expanded accordingly. Supported by this fund, which was used in every prefecture, local governments are struggling to create new jobs in the affected areas by taking various measures. One of these measures is a program wherein people affected by the disaster are paid to engage in restoration and reconstruction projects in the affected areas. They can then use their pay to rebuild their lives, in accordance with the concept of cash-for-work (CFW). Specifically, disaster victims engaged in various kinds of work necessary for the operation of evacuation shelters in the affected areas (e.g. providing security, taking care of elderly people and children, preparing meals, and supporting administrative affairs) are to be paid for their work. The CFW concept was originally derived from a project carried out in Africa to distribute food to refugees in exchange for their engagement in work, such as drought prevention.⁴ It has come to be used to secure employment for disaster victims while encouraging them to participate in the restoration and reconstruction process. However, the CFW scheme is designed only to achieve the goals set for the initial stage immediately after the disaster, i.e., participation of disaster victims in the restoration and reconstruction process, and needless to say, the issue that arises here is how to link their engagement in such temporary work to stable employment after the reconstruction process gets on track to a certain level. As the CFW scheme involves a variety of parties, including not only government agencies but NPOs and citizens' groups, as well as many staffing companies that play a role in ensuring efficient job matching, it is expected that a network for each type of work will be expanded and organized, thereby firmly establishing the work as an independent business and ultimately providing a sort of permanent employment.

Conventional employment measures, such as helping employers maintain employment via increased employment adjustment and SME subsidies and creating jobs through the reconstruction of local industries and the creation of new industries, result in the restoration of the traditional company-reliant employment system which would remain vulnerable to disasters in the future. By contrast, the CFW scheme is notable because if it were to succeed in creating new types of business entities, it could possibly bring about a new model of employment different from the traditional, self-contained model that has heretofore been adopted by companies. For example, after the earthquake, in addition to members of the

⁴ For the specific significance and functions of the CFW scheme, see the article entitled "Kyasshu-fo-waku ga Nihon wo Sukuu? [Will CFW save Japan?]," *Posse* 13 (November 2011).

Japan Self-Defense Forces and government personnel, a number of volunteers assembled in the affected areas, and various non-governmental organizations such as labor unions, citizens' groups, and workers' cooperatives engaged in restoration work. The operations undertaken by these organizations were temporary and did not directly lead to the creation of permanent jobs in the affected areas. If the building of an alternative employment system is urgently needed, aggressive efforts need to be made to develop an environment linking the CFW scheme to permanent employment. To achieve this, the government should provide more financial assistance for the establishment and management of NPOs, codify workers' cooperatives, support micro businesses, promote the creation of social enterprises, abolish the union shop rule; abolish the check-off system, expand the scope of the definitions of "employer" and "worker" under the Labor Union Act and develop laws enabling labor unions to be independent of companies (e.g. a tax system to support labor unions).

It is assumed that these new type of business entities will be more motivated to take part in the target project and to increase their specialized capabilities in relation to the type of project, rather than merely increasing the size of their businesses or their profits. Accordingly, more emphasis will be placed on the job experience and career building of individual workers rather than on the features relating to the organizational structure of the project. From this viewpoint, it is necessary to develop a system and institution to help workers improve their careers. This will lead to increased mobility in the labor market as a whole and will benefit conventional Japanese corporations as well, as they are under continual pressure to become more internationally competitive. As is well known, talented university students in the United States are most eager to find employment in IT ventures and other new businesses. They do not see joining a large corporation to be a priority. If these new types of business entities become popular in Japan, more young people will aspire to cultivate their abilities while working in efficiently managed micro businesses, and to then start up NPOs of their own. The need to develop human resources equipped with universal educations and career experience rather than capabilities useful exclusively to a particular company has been repeatedly pointed out. It is absolutely necessary to carry out reforms based on the current state of conventional employment, but at the same time, we must not think lightly of taking action in anticipation of a new employment system. Japan has to create labor market policy with the risk of a large-scale natural disaster always in mind, and cannot avoid tackling the reorganization of the employment system, among other reforms.

2. Reorganization of the Employment System

In order to build a disaster-resistant labor market, it is essential to create new types of business entities that suit the abovementioned job/career-oriented employment approach. Among these business entities, NPOs have not yet been given sufficient legislation to fulfill their potential. The government should enact the necessary measures as soon as possible, such as relaxing the requirements for the establishment of NPOs (e.g. relaxing the require-

ment that an NPO have at least ten members and simplifying the authorization procedure) and applying preferential treatment to them in terms of the taxation of donations (e.g. lowering the minimum donation tax deduction [10,000 yen for income tax and 100,000 yen for local inhabitants tax], extending the authorization period [two years], and introducing a provisional authorization system). At the same time, in order to prevent anti-social groups from obtaining NPO status while ensuring that NPOs act properly and vigorously, the government should also strengthen the system for ensuring the transparency of NPO activities, such as disclosure of their activity reports. At present, 60% of all NPOs in Japan have an annual income of five million yen or less. Among these, 46.7% operate at a deficit and 14.9% are insolvent. Issues that cannot be attributed immediately to deficiencies in legal systems or administrative measures are to blame for this serious situation, but there is no doubt that promoting system reform is a top priority.

The delay in passing legislation related to workers' cooperatives may also be a problem. A workers' cooperative is a type of organization widely used in developed countries other than Japan, first established by Father José María Arizmendiarieta in Mondragón, Spain, in the mid-20th century; it has since spread widely and has rapidly developed.⁵ Unlike a general type of industrial cooperative, a workers' cooperative is established with funds contributed by its worker-members, and profits earned by the cooperative are distributed to them. As workers themselves are responsible for establishing and managing the cooperative and earn profits from it, there is, in principle, no labor contract or labor-management relationship between workers and the cooperative, and participants in the cooperative do not fall within the definition of "workers" under the Labor Standards Act. Although some arrangements could be made to give members of workers' cooperatives the status of workers under the Labor Standards Act, the workers' cooperatives bill now being deliberated in the Diet would not offer them such status. It is true that a workers' cooperative is a common type of organization throughout the world, and that there are complicated factors behind the failure of the bill to mature into a law, but the most important problem is that the creation of workers' cooperatives as legal entities has not been supported widely among the general public or sufficiently supported by various other organizations that should be championing it, such as the Labour Lawyers Association of Japan. It cannot be completely denied that members of workers' cooperatives might be improperly used as cheap labor,⁶ but this risk is not an issue specific to a workers' cooperative but is rather a general issue arising from the existing wage system that has been unable to accommodate the dramatic increase in the number of non-standard workers or to otherwise change with the times. The risk of the abuse of workers is insufficient to support an argument that a

⁵ For the origin and specific significance and functions of a workers' cooperative, see Shinobu Nogawa, Hajime Wada and Susumu Noda, *Hatarakikata no chie* [Wisdom for working] (Tokyo: Yuhikaku, 1999), 50ff.

⁶ Tetsuo Kamota, "Kyasshu-fo-waku wo Rodoho kara Kangaeru [Cash-for-work under the labor law], *Posse* 13 (November 2011).

workers' cooperative would limit opportunities to work, and should therefore be reconsidered. Above all, workers' cooperatives have, in general, provided a solid foundation for international cooperation, and moreover, they accumulate know-how which allows them to provide people who tend to be at a disadvantage on the ordinary labor market, such as women and elderly people, with opportunities to exert their potential through engagement in work. Progress should be made in passing the legislation in relation to workers' cooperatives.

IV. Future Prospects for the Labor Law System

1. Basic Framework

In addition to making arrangements to the labor law system based on the assumption that an external, sudden event, such as a large-scale natural disaster, would have a massive and serious impact on the labor situation, it is also important to take the labor law system's current state into account and determine a future direction for it. Major changes have been made to the labor law system since the beginning of the 21st century, such as the establishment of a labor dispute resolution system centered on the labor tribunal system, expansion and deepening of the legal system governing non-standard workers (e.g. revision to the Temporary Agency Workers Act (Act for Securing the Proper Operation of Worker Dispatching Undertakings and Improved Working Conditions for Dispatched Workers) and the Part-Time Workers Act (Act on Improvement, etc. of Employment Management for Part-Time Workers) and codification of fixed-term labor contracts), and the enactment of the Labor Contract Act. However, the reforms to the labor law system have not fully taken disaster resistance into account. Although it is unavoidable that priority would be given to the restructuring of the labor law system for normal times, efforts should be made to design new mechanisms or interpretative theories focusing on disaster preparedness.

The basic framework for a future vision for the labor law system would be closely connected with the abovementioned arrangements. In concrete terms, this task should be accomplished via the following process: [1] as an initial measure, provide workers with more diversified jobs and encourage them to develop more universal careers, thereby enhancing and securing their opportunities to work in various forms, not limited to working as company employees; [2] in accordance with the principle of progressing toward an elastic and flexible labor market while avoiding an overly hasty transition, build mechanisms to enable targeted groups of people — non-standard workers, women, elderly people, young people who usually work on a part-time basis (generally referred to as *freeters* (a combination of the English word “free” and the German word “*arbeiter*”) in Japan) and those who are currently not in employment, education or training (NEETs), and foreign workers — to exert their potential to the fullest extent, achieve an appropriate work-life balance for all workers, and invigorate the labor market.

2. Work-Life Balance

Dramatic changes in the workforce caused by various factors, including changes in economic structure and the declining birth rate coupled with the aging of society, call for legislative and administrative responses. As the concept of work-life balance has permeated society, provisions concerning equal treatment of part-term and regular workers have been incorporated into the Part-Time Workers Act and the provisions of the Child Care Leave Act (Act on the Welfare of Workers Who Take Care of Children or Other Family Members Including Child Care and Family Care Leave) have been upgraded. Furthermore, the prevalence of temporary agency workers—a new type of workers which signifies the diversification of employment status—has given rise to problems, including the practice of dispatching workers in the guise of service contracts or dispatching workers on a daily basis in violation of the law. This has pressed the government to take appropriate measures, and as a result, a substantive law to regulate fixed-term labor contracts is finally near passage. Taking these developments and the situation after the great earthquake into account, what does the future of the labor law system look like?

The Part-Time Workers Act was revised in 2007 to incorporate provisions requiring employers to treat part-time and regular workers equally in terms of per-hour wages if they engage in the same jobs for the same number of hours. Specifically, the revised Act stipulates equal treatment in terms of wages, education/training, and welfare programs for part-time workers if they are subject to the same conditions as regular workers with regard to three factors: job description, promotion, and contract period. In actuality, this revision may not be very effective in improving the working conditions of part-time workers. For example, in a workplace where the prescribed working hours for regular workers are eight hours each day, and part-time workers are engaged in the same job as said regular workers for six hours each day, the employer only has an obligation to “endeavor” to apply equal treatment. Nevertheless, it is expected that personnel management practices which accord with the essence of this revision will become widespread. In addition, as a result of revisions to the Employee Pension Insurance Act in 2007, part-time workers who have been employed for one year or more, who work for 20 hours or more per week, and who receive 98,000 yen or more as compensation per month (about 1.18 million yen per year) are eligible for employee pension insurance. However, as SMEs with 300 or fewer employees are currently exempt from this rule, it is estimated that fewer than 200,000 part-time workers will actually receive employee pension insurance.⁷ These legal revisions are significant steps forward in the process of increasing the perceived importance of jobs undertaken by part-time workers and enabling these workers to shape their careers while building homes, but they are focused on achieving equal treatment for part-time and regular workers within

⁷ For issues relating to the enforcement of the revised Part-Time Workers Act, see Daisuke Kitaoka, “Kaisei Pato Rodoho Shiko Tsutatsu no Kaisetsu [Commentary on the notice of enforcement of the revised Part-Time Workers Act],” *Rodohogaku Kenkyukaiho*, no. 2422 (2008): 3ff.

their respective companies. Companies should make better use of the unique characteristics of part-time workers, such as the fact that they do not firmly belong to the companies where they work and can move more freely than regular workers. Specifically, companies should provide part-time workers with opportunities to develop their careers, and should place more importance on giving them adequate annual paid leave, allowing them to take days off to engage in activities to obtain qualifications. Companies should also pay part-time workers wages that befit their jobs. Compared to these measures, applying the same employment protection rules or the same personnel management systems to part-time and regular workers may not necessarily be top priority tasks.

Regarding the concept of work-life balance, the Child Care Leave Act has been upgraded since the beginning of the 21st century to make it easier for workers to take child care leave and nursing care leave. For example, workers employed on a daily or a fixed-short time basis may now take child care leave, discriminatory treatment of workers who take child care leave or nursing care leave has been prohibited, workers may now take nursing care leave several times within the prescribed period, and increased allowances for child care leave or nursing care leave are paid under employee insurance during the leave. In Japan, workers still face difficulty in finding enough time for childrearing or private activities and in maintaining a balance between their working and private lives, and it is absolutely necessary for the government to undertake diverse policy measures to achieve an appropriate work-life balance. Meanwhile, in anticipation of a sudden, large-scale disaster, the government should improve the special rules which apply in the event of a natural disaster, provided in Articles 19 and 20 of the existing Labor Standards Act, to protect workers on child care leave or nursing care leave by, for example, giving preference to such workers in returning to their original jobs or finding them re-employment.

3. Policy Measures to Cope with Non-Standard Workers

There have been many developments in recent years with regard to the treatment of the major types of non-standard workers, i.e., part-time workers, temporary agency workers, and fixed-term contract workers. For part-time workers, as discussed above, the Part-Time Workers Act has been revised to achieve equal treatment between part-time and regular workers in terms of the status under the personnel management system, working hours and other working conditions, and related reforms are ongoing in line with the long-advocated principle of *equal pay for work of equal value*. For temporary agency workers, efforts have been made to publicize the necessary information and improve the functions of public employment security offices so that workers dispatched by temporary staffing agencies on a daily basis can also receive job applicant benefits for day workers. Furthermore, with regard to fixed-term labor contracts, the Labor Policy Council submitted a proposal to the Minister of Health, Labour and Welfare at the end of 2011 to the effect that the rule prohibiting employers from refusing to renew fixed-term labor contracts without reasonable grounds upon

the expiration of their terms, which has been established as case law, should be expressly stipulated in the Labor Contract Act. The proposal also included the idea of vesting fixed-term contract workers with a right to turn their fixed-term contracts into labor contracts without a fixed-term if their contracts have been repeatedly renewed for more than five years. These proposed measures may be effective in realizing stable employment and improved treatment for non-standard workers whose number has been rapidly increasing. However, in the context of disaster preparedness, a certain policy shift is necessary to attach more weight to promoting the career development of non-standard workers. Regulations designed to maintain the employment of non-standard workers at their respective companies must not reduce their chance to change jobs smoothly and fairly when necessary, and it is also urgently necessary to create a system to address the career development handicap that non-standard workers suffer as a result of their employment status to the extent possible. With regard to the latter objective, if promotion to regular employment is impossible for non-standard workers, employers must establish rules allowing such workers to concurrently engage in second employment or to engage in activities to obtain qualifications, while the government must build extensive mechanisms to promote their career development.

4. Initiatives to Reinvigorate the Labor Market and Rectify Its Disparities

The diversification of employment status and workers' statuses has given rise to the need to provide people with as many choices of work as possible and to develop an environment where people can enter the labor market as easily as possible. It is now also absolutely necessary to take measures to guide people who are unemployed or in unstable employment—not only including elderly people and women but also young people categorized as *freeters* and NEETs—into the labor market and thereby rectify social disparity. Against this background, the laws and regulations whose major purpose is to control the labor market (e.g. the Employment Insurance Act, the Employment Countermeasures Act, etc.) have undergone repeated revision, as has the Minimum Wage Act, to support workers' standards of living. There is a need to consider how these trends may be further advanced in the future with a view to establishing a framework for a post-earthquake labor law system.

Looking at developments in recent years, the Employment Insurance Act has undergone a shift in its core functions, resulting in the elimination of employment welfare services from the categories of employment-related services carried out under it, leaving only employment stabilization services and human resource development services. Revisions were also made to this Act in 2007 to lower the insurance premium rate from 1.6% to 1.2%, while increasing the child care leave allowance to 50% of a worker's normal wages. Furthermore, the relevant systems have been reformed in various ways in order to provide modest benefits for a large number of workers. The distinction has been abolished between part-time workers and generally insured persons in terms of the length of the insured period required to receive job applicant benefits, the maximum benefit amount for educational

training has been reduced while the length of the insured period required to receive such benefits has been shortened.

In addition, the long-awaited Job Seekers Support Act was enacted in 2011, building a system to support job seekers who are not covered by employee insurance to sustain their livelihoods, participate in vocational training courses, and have access to job offers. This new system is based on a concept that is similar to the concept of “basic security benefits for job seekers,” adopted in foreign countries (referred to as *Grundsicherung für Arbeitsuchende* in Germany). It targets workers who are not eligible to receive employee insurance benefits because they have not paid insurance premiums for an adequate period, such as *freeters*, NEETs, and new graduates, as well as entrepreneurs who have been forced out of business due to the economic recession. Under this system, the targeted people may apply to public employment security offices to receive 100,000 yen (or 120,000 yen in the case of the head of a household) per month as living expenses, and may apply for and take vocational training courses after consultation with these offices. After completing the training courses, targeted persons will have the chance to find jobs in collaboration with the public employment security offices. Some people fault this system for setting strict requirements for the receiving of support, such as only providing support for people with individual incomes of 80,000 yen or less (or household incomes of 250,000 yen or less) per month, requiring support recipients to participate in all of their training courses during the training period and disqualifying people who are absent from training for over 20% of the course, even if their absence was due to illness or other unavoidable reasons. However, this system was originally designed to give emergency assistance to unemployed workers who are ineligible for employee insurance benefits and who may remain unable to enter the labor market, to allow such workers the chance to find employment. In this respect, it is different from the conventional support system covered by employee insurance, which is designed to help workers who enjoyed stable employment but suddenly lost their jobs due to the bankruptcy of their employers return to the labor market. Therefore, the requirements for receiving support and the process leading to employment must be strict to some degree.

The job seeker support system can be regarded as one of the key labor market policies formulated in anticipation of a large-scale disaster. When a vast number of people become unemployed at the same time, emergency measures are necessary, such as the *Japan As One* Work Project discussed above. However, it would be more effective to ensure that various ways of accessing the labor market are always available and that flexible and progressive opportunities for employment are provided. When this system, which has been in operation since April 2011, gets on track, it will be possible, for example, to enhance the system for a limited time to also target unemployed people who cannot be sufficiently covered by employee insurance or emergency measures in the event of a disaster, thereby providing them with various training programs with the aim of shifting the labor force away from industries that have suffered catastrophic damage.

To achieve this, the job seeker support system must be publicly financed, and the

current financing scheme of allocating employee insurance funds to this system must be abolished in three years as scheduled.

V. Road to an Integrated Labor Market Policy

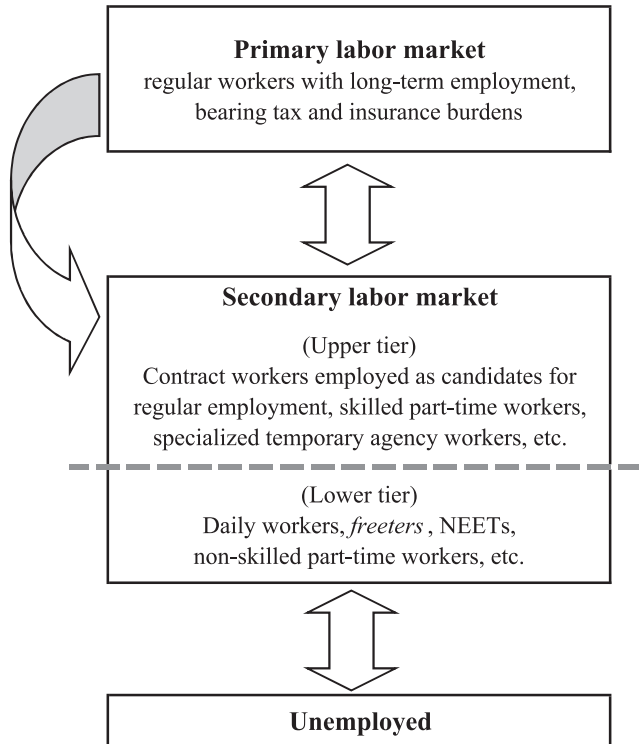
1. Possibility of a Multi-Stage Labor Market

The structure of Japanese employment in recent years displays several characteristics.⁸ Firstly, the number of employed persons has continued to decrease over the long term. The number of persons employed in many industrial sectors has declined, with significant downward trends in construction and manufacturing in particular, while the number of persons employed in accommodations, food and drink services, and in medical, health care and welfare services has increased slightly. Thus, the number of employed persons has been increasing in industrial sectors which do not primarily rely on the long-term employment system, and it may be assumed that this could be one of the causes of the increase in the number of non-standard workers. Secondly, one-third of unemployed job seekers voluntarily left their previous jobs, while 37% left their previous jobs involuntarily, due to reasons attributable to their employers or due to mandatory retirement/termination of their employment. These results may suggest that workers are unable to sustain the motivation to work at the same jobs for long periods because of the limited number of good quality jobs, and may also reflect the recent harsh economic conditions, the increase in the number of fixed-term contract workers, and the growing concern for life after retirement. Thirdly, reviewing the unemployment rate by family relationship, the unemployment rate was less than 3% for heads of a household and for spouses of a head of household, while exceeding 8% for other family members of a household and standing at about 6% for the unmarried. It may be assumed that this trend reflects the increase in the number of new graduates without jobs and *freeters* and also implies that people find it difficult to form a household due to the lack of prospects for stable income.

These employment realities indicate the limits of the employee insurance system premised on stable employment, and suggest that job seekers facing difficulty in finding employment or re-employment are becoming a semi-permanent group.

Taking into consideration the above-described current situation, combined with the risk of a large-scale disaster, it is clear that at present, Japan must move in the direction of eliminating rigidity in employment and the structured distinction between standard and non-standard workers, thereby drastically increasing the opportunities to work and reconstructing the labor market into a multi-staged form.

⁸ Ministry of Public Management, Home Affairs, Posts and Telecommunications, *Labor Force Survey* (December 2011).



Labor Market in Japan

2. Future Labor Market Policy

In the existing labor market, the number of workers able to enjoy stable employment has been gradually diminishing, while the number of workers in low-wage and unstable employment, such as fixed-term contract workers, daily workers, and part-time workers, has been increasing. This situation can be illustrated as shown in the figure.

In Japan, the capacity of the primary labor market, which exists on the basis of stable employment, is rapidly diminishing. The secondary labor market, to which a number of non-standard workers belong and which provides jobs that are not of good quality in terms of wage and working conditions, is expanding. Another group of people who are unemployed and seeking a job—that is, people who do not belong to neither of these markets—is also increasing. In such a situation, the secondary labor market is expected to serve as a buffer to prevent a rapid increase in unemployment while at the same time serving as the preparatory stage to finding a better job.⁹

⁹ This is similar to the concept of an “intermediary labor market,” proposed by Professor Yuki Honda of the University of Tokyo. See Professor Honda’s comments, *supra* note 4, at 111, in the article entitled “Kyasshu-fo-waku ga Nihon wo Sukuu? [Will CFW save Japan?]”

From this viewpoint, the first key to long-term future labor market policy is to provide job seekers with access to the primary labor market if possible, and at least to the second labor market. The recently enacted and implemented reforms to the employee insurance system and to the permanent system to support job seekers are basically consistent with this key element. Although employee insurance may continue to be very useful in helping people who have fallen out of the primary labor market and become unemployed, the permanent job seeker support system will play an effective role in supporting those who have left the secondary labor market. A second, and absolutely necessary key is to establish a route from the secondary labor market to the primary labor market. For example, Germany, which served as a central model in the drafting of the Job Seekers Support Act, is trying to provide workers who have entered the secondary labor market with various opportunities to improve their vocational capabilities and gain access to job offers, thus assisting them in ascending to the primary labor market.¹⁰ Japan also needs to have a grand design to prevent workers who have been forced out of the primary labor market and into the secondary labor market from falling into unemployment, and to help them return to the primary labor market. Essential factors in this may be wider dissemination of the vocational training system and large-scale implementation of career consulting services. The third key is to drastically increase opportunities to work other than as company employees. As discussed above, in addition to supporting business start-ups in general, a new system should be developed to make it easier to establish and manage NPOs and micro businesses, and the workers' cooperatives bill should be enacted as soon as possible. Lastly, the passage of the employment contract law is also a pressing issue. The Labor Contract Act currently in effect is a very small law for various reasons. It is hoped that, in concert with the movement toward drastic revision of the law of obligation in the Civil Code, actions will be taken to delete the provisions concerning employment contracts from the Civil Code and to re-define the category of "employment contracts" so as to cover "labor contracts" in strict legal terms as well as similar forms of contracts concluded for providing labor, thus establishing a legal basis for coping with problems faced by non-standard workers and other workers who are under service contracts in appearance but, in substance, are engaged in work as employees.

¹⁰ For the details and significance of the labor market reforms in Germany, see Michitaka Nako, "Doitsu no Kyushokusha Shien Seido [Job seeker support system in Germany]," *Quarterly Labor Law*, no. 232: 29, and for the significance of these reforms to Japan, see Shinobu Nogawa, "Koyo Hoken to Kyushokusha Shien Seido no Kadai to Tenbo [Issues and prospects with regard to employee insurance and the job seeker support system]," *Quarterly Labor Law*, no. 232: 2.

The Mechanism behind the Increase in Non-Regular Employment: Case Study of the Supermarket Company A*

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If securing the manpower required to carry out certain jobs and allocating the work are defined as the “employment portfolio,” one has to say that the mechanism behind this has not been adequately identified. Previous studies present employment typologies using indicators such as skills, but determining the specific content of jobs (the scope of jobs or roles required) in advance is the prerequisite for this. However, the results of an analysis of Company A revealed the following: (i) Company A has a manpower calculation standard called “the man-hour standard,” which is used to determine the number of personnel in stores and specific sales departments; (ii) this standard is constantly revised in order to achieve profit targets; (iii) as a result of the above, regular employees are allocated to each store as a given, but it is not possible for all jobs at the store to be carried out using these workers alone, so part-timers are also used within the scope of the budget allocated to each store; and (iv) the employment portfolio is organized based on the results of this, but the roles, scope of jobs and skills required of non-regular employees is determined after the fact. In other words, it is vital to construct a theory based on the actual situation, unlike existing studies, which explain the employment portfolio in terms of skills, etc.

I. Introduction

1. The Objective of This Study and the Awareness of the Issues

The objective of this paper is to identify the mechanism that has brought about an increase in non-regular employment, focusing on the supermarket Company A.

It is common knowledge that the use of non-regular employment is expanding. Table 1 shows the proportion of all workers accounted for by each employment type, based on the General Survey on Diversified Types of Employment carried out by the Ministry of Health, Labour and Welfare. According to this, the proportion of regular employees fell by approximately 23% over the course of a little more than two decades, from 1987 to 2010. Looking at it solely in terms of the proportion of regular employees, one can calculate that a quarter of regular employees switched to non-regular employment over the aforementioned 20 years or so.

Furthermore, if one looks at the proportion accounted for by non-regular employment, one can see that the share accounted for by part-time workers increased between 1987 and

* The analysis in this paper is based on surveys focused on the supermarket Company A. The author would like to express his sincere gratitude to everybody at Company A who cooperated with these surveys. A total of four surveys were carried out, on October 9, 2009, June 10, 2010 (twice on the same day), and August 27, 2010.

Table 1. Changes in Types of Employment (%)

	1987	1994	1999	2003	2007	2010
Total	100.0	100.0	100.0	100.0	100.0	100.0
Regular employees	84.0	77.2	72.5	65.4	62.2	61.3
Non-regular employees	16.0	22.8	27.5	34.6	37.8	38.7
Contract employees	0.9	1.7	<u>2.3</u>	<u>3.7</u>	<u>4.6</u>	<u>5.9</u>
Transferred employees	1.2	1.4	1.3	1.5	1.2	1.5
Dispatched workers	0.6	0.7	<u>1.1</u>	<u>2.0</u>	<u>4.7</u>	<u>3.0</u>
Temporary employees	<u>2.6</u>	<u>4.4</u>	<u>1.8</u>	0.8	0.6	0.7
Part-time employees	9.9	13.7	<u>20.3</u>	<u>23.0</u>	<u>22.5</u>	<u>22.9</u>
Others	0.9	1.0	0.7	3.4	4.3	4.7

Source: Compiled from Ministry of Labor (1987, 1994) and Ministry of Health, Labour and Welfare (1999, 2003, 2007, 2010).

Note: Underlined figures indicate high proportions.

2003, remaining at around the 23% level thereafter, while the share of contract workers increased consistently from 1987 to 2010. The proportion of dispatched workers grew between 1987 and 2007, but was on the decline in 2010. In other words, one can see that the increase in non-regular employment is not the result of the growing use of a particular type of employment, but is rather due to companies having opted to use a diverse range of employment types, leading to a rise in the proportion accounted for by non-standard employment overall.

Incidentally, if one uses the term “employment portfolio” to refer to the decisions made concerning the types of employment to be used by each company and the number of people to be utilized by employment type, and the allocation of work through their deployment in the workplace, the aforementioned results provide an overall indication of each company’s employment portfolio. That is to say, the results shown in Table 1 capture an ex post facto snapshot of the overall shape of each company’s portfolio. Accordingly, in order to reveal the background to this increase in non-regular employment, it is necessary to identify the theories based on which companies decide on the combination of non-regular employment and the number of people to be used, and the mechanism behind this.

As such, this paper examines the background factors that have brought about an increase in non-regular employment, focusing on the supermarket Company A. Supermarkets are one of the business types that account for a high proportion of non-regular employment, so it would seem that their management capacity in regard to non-regular employment is more advanced. Company A has a chain of stores, centered on the Greater Tokyo area, and part-timers account for more than 80% of its total workforce. Company A is an example that

corresponds to the aforementioned conditions.¹

2. Survey Overview and Method

(1) Survey Overview

The analysis in this paper is based on a case study. The case study referred to here consists of a series of surveys carried out as part of the “Study on the Current Status of the Employment Portfolio System at Japanese Companies,” which is a sub-theme of the research project being carried out by the Japan Institute for Labour Policy and Training, entitled “Comprehensive Research for Building Stable Labor and Management Relations in Individualized Labor Relations.” In this project, 28 surveys were carried out among eight organizations between FY2009 and FY2011. The cases examined were two supermarkets (Company A and Company B), two department stores (Company C and Company E), City Office D, two electrical machinery manufacturers (Company F and Company G), and steel manufacturer Company H.

Of these, this paper will analyze the supermarket Company A. Unless otherwise specified, the analysis is based on interview surveys carried out at this company. The surveys were carried out by Keisuke Nakamura (Professor, Institute of Social Science, University of Tokyo), Kasumi Nomura (Senior Research Officer, Japan Institute for Labour Policy and Training) and the author of this paper, with the author writing up the results concerning Company A.

(2) Survey Method

What must be considered with regard to survey methods is the question of what kind of approach is required in order to identify the factors behind the use of non-regular employment. According to Nitta (2008), the primary factors in companies’ utilization of non-regular employment are cost-cutting and risk avoidance. In other words, what is behind the use of non-regular employment by Japanese companies is their goal of adjusting the volume of employment according to the volume of business, to the greatest extent possible, by using non-regular employees, who do not require the same guarantees of employment as regular employees, while at the same time reducing the total labor cost by using non-regular employees, who are cheaper to hire than regular employees.

Accordingly, in this study, it was decided to approach the topic from the angles of both cost (management of the total labor cost²) and the volume of employment (manpower management). More specifically, the study focused on how the company estimates and decides upon the total labor cost (including those resulting from non-regular employment), and how the company calculates the number of personnel (including non-regular employ-

¹ As well as regular employees, Company A also uses part-timers, and at the time of the first survey, in October 2009, part-timers accounted for 81.3% of the company’s total workforce.

² Usually, the term “labor costs” refers solely to those arising from regular employees, but in this paper, the total cost including wages paid to non-regular employees is defined as the total labor cost.

ees) required to carry out certain jobs and how it goes about securing those personnel (manpower management).

However, in general, whereas the term “labor costs” refers solely to those arising from regular employees, with the head office personnel department in charge of the employment and management of regular employees, the wages paid to non-regular employees are sourced from budget items other than those earmarked as labor costs, and a specific department is in charge of the employment and management of non-regular employees. Accordingly, in this study, surveys were conducted among the managerial staff in both the head office personnel department and the specific department dealing with non-regular employees. In the case of Company A, interviews were carried out with those who had experience of working in the head office personnel department and as a store manager. For more details of the survey schedule and content, see Japan Institute for Labour Policy and Training (2011, 4).

3. Previous Studies

(1) The Flexible Firm Model and the Human Resource Portfolio Theory

The flexible firm model was advocated by Atkinson (1985). This model asserts that flexibility is required in order to respond to environmental changes, such as economic slowdowns, growth in uncertainty in the market, rapid progress in technological innovation, and the reduction of working hours. There are three types of flexibility—functional flexibility (achieving greater flexibility in the abilities and skills of personnel), numerical flexibility (adjusting the volume of employment), and financial flexibility (achieving greater flexibility in labor costs)—and companies use non-regular employment as a means of achieving this flexibility according to their own requirements. According to the aforementioned Nitta (2008), Japanese companies think in terms of numerical flexibility and financial flexibility.³

Lepak and Snell (1999) is a leading study concerning the human resource portfolio theory.⁴ Lepak and Snell (1999) introduced four types of employment using the two axes of uniqueness of human capital and value of human capital. If this model is followed, regarding the type that demonstrates high scores for both indicators (regular employees), a policy of cultivating such employees within the organization is chosen. In the case of personnel who have a high value of human capital but a low uniqueness of human capital score (part-timers), it is possible to procure them externally, so there is little necessity to bring them inside the company. With regard to the type that has a high uniqueness of human capital but a low value of human capital, the partnership option is selected, while companies consign work to the type with low scores for both indicators on the basis of contracts (contracting).

³ Sato (2003) can be cited as an empirical study analyzing Japanese companies on the basis of the flexible firm model.

⁴ Hirano (2009) can be cited as a study based on Lepak and Snell (1999).

(2) Consideration of Previous Studies and Presentation of Hypotheses

In the section above, dealing with previous studies, the flexible firm model and the human resource portfolio theory were cited as leading studies. Let us now examine these two models, while bearing in mind their application to Japan.

Firstly, let us consider the flexible firm model. As stated by Sato (2003) and Nitta (2008), there are elements of this model that apply to Japanese employment practices and personnel management. These are the numerical flexibility and financial flexibility aspects that have already been touched upon. However, as pointed out by Sato (2002), unless we elucidate the mechanism behind the ongoing increase in non-regular employment, accompanied by a fall in the share of regular employees, at the company and workplace level, it is hard to verify whether it is possible (or difficult) to explain the employment portfolio at Japanese companies by using the flexibilities propounded in this model. One would add that if financial flexibility is a factor behind the use of non-regular employment, it is necessary to clarify how companies decide on and manage the wages (costs) paid to regular and non-regular employees. In other words, the problem with this model is that it does not verify how this numerical flexibility and financial flexibility is achieved within a company.

Next, let us look at the human resource portfolio theory. The issue that arises when applying this model to Japan is the fact that it is unable to explain the qualitative utilization typified by part-timers. Qualitative utilization is defined as “a situation in which the abilities of part-timers and the content of their work in a workplace increase to a level at which they are little different from those of regular employees” (Honda 2004, 16). In other words, a qualitative rise in the abilities and jobs of Japanese part-timers can be seen, but these are not uniform.⁵ If one explains this fact using the human resource portfolio theory, one can see that although their employment type is described as part-time, part-timers who are being qualitatively utilized have similar abilities to regular employees and take on jobs equivalent to those of regular employees, so in terms of both skill and jobs, they belong in the same type classification as regular employees.

The same applies to the process of employment adjustment in Japan. In the event of a recession, Japanese companies assign the highest priority to securing the employment of regular employees and press ahead with employment adjustments targeting non-regular employees. In other words, non-regular employment fulfills the function of a pressure regulator (a buffer function) for maintaining the employment of regular employees, and the number of regular employees becomes a given for the company, except for new hires. In this situation, work must be allocated to regular employees, whose labor costs are high, so the jobs and skills expected of non-regular employees are decided after the work to be allocated to regular employees has been determined. As a result, the jobs and skills required of non-regular employees are stipulated after the fact. This also demonstrates that it is not pos-

⁵ Nakamura (1989), Aoyama (1990) and Mitsuyama (1991) shed light on the facts concerning the qualitative utilization of part-timers in Japan up to the early 1990s.

sible to explain the Japanese employment portfolio using the human resource portfolio theory.

From the aforementioned two models, one can see that they each have problems in explaining how the employment portfolios of Japanese companies are decided. In light of these issues, it was decided to conduct the study in this paper based on the two hypotheses below.

Hypothesis 1. It seems that the management of the total labor cost affects the structure of the employment portfolio of an organization.

Hypothesis 2. It seems that the employment portfolio of an organizational unit is structured on the basis of Hypothesis 1 and that the roles, scope of jobs and skill levels required of non-regular employees are determined as a result. In addition, it seems that the treatment of non-regular employees is revised in response to these.

The first hypothesis is that the structure of an employment portfolio is affected by the management of the total labor cost. Companies aim to maximize their profits, so in order to earn more profit, they endeavor to expand sales and reduce costs. The latter leads to reducing personnel costs and is thought to be the incentive that drives companies to curb the number of regular employees and make use of non-regular employees.

The second hypothesis is that once an organization's portfolio has been structured, the roles, scope of jobs and skill levels required of non-regular employees are decided upon and their treatment is determined in response to these. Once companies determine the number of regular employees, they allocate them to each workplace as a given. However, if they are requested to curb the number of regular employees in order to manage the total labor cost, in line with the first hypothesis, they become unable to complete all of their work using regular employees alone. This gives rise to scope for the use of non-regular employees, who carry out their work within that scope. In other words, it appears to be the case that once jobs have been allocated to regular employees, the roles, scope of jobs and skill levels required of non-regular employees are decided upon after the fact and their treatment is revised in response to these.

4. Analytical Framework

In this paper, responsibility centers are used as the analytical framework. A responsibility center is "an organizational unit for which the manager is responsible for the results measured in monetary terms, such as sales, costs and profits" (Nakamura 2006, 196). In other words, this shows the financial indicators on which the management of the organization is based; manpower management and total labor cost management are also influenced according to the types of indicator used.

Table 2. Types of Responsibility Center

Type	Content	Financial Indicator (example)	Case
Revenue	Has responsibility for output measured in monetary terms.	Turnover	Company C's stores
Designed cost center	Has responsibility for the amount rationally calculated to be the cost of the workforce, material, power, etc. that is necessary in order to produce a certain level of output.	Costs	
Discretionary cost center	Determined on the basis of the manager's judgment, as the cost cannot be calculated rationally.	Cost is not a financial indicator	City Office D Company H's central research institute
Profit center	Has responsibility for profits after deducting costs from revenue measured in monetary terms.	Amount of profit	All of Company A and its stores All of Company B and its stores All of Company C All of Company E All of Company F and its establishments All of Company G and its establishments All of Company H
Investment center	Has responsibility for profits earned from a certain level of investment.	Return on investment	

Source: From Japan Institute for Labour Policy and Training (2012, 15).

To explain this in more concrete terms, in the case of a profit center, a certain amount of profit is set as the target value, and the organization concerned must manage both sales and costs in order to secure that profit. In contrast, in the case of a revenue center, a certain level of turnover is set as the target, but it is possible to incur costs in order to increase turnover, so there is less pressure to reduce costs, including labor costs, than in the case of a profit center.

Table 2 explains this in greater detail and applies it to the cases in this study. According to this, companies are ultimately profit centers, but in this particular case, the whole of Company A, including its stores, is a profit center. In other words, Company A sets profit targets for its stores as well, so they must pay attention to both sales and cost management.

Table 3. Policy Matrix of Company A

	Sales (small)	Sales (medium)	Sales (large)
<i>Compact supermarket</i> Approx. 990m ²	Less than ¥2.5 million	At least ¥2.5 million Less than ¥3.5 million	At least ¥3.5 million
<i>Supermarket</i> Approx. 900m ² to 1,650m ²	Less than ¥3 million	At least ¥3 million Less than ¥4 million	At least ¥4 million
<i>Super-supermarket</i> Approx. 1,650m ²	Less than ¥4 million	At least ¥4 million Less than ¥5 million	At least ¥5 million

Source: Based on the second survey (June 10, 2010).

II. Case Study of Company A

1. Management Reforms

Company A carried out management reforms during the mid-2000s. There were three key reforms: (i) the stores switched from being revenue centers to being profit centers, due to having experienced losses during the mid-2000s; (ii) a policy matrix was designed, with the positioning of stores, the manpower in stores, and the broad outlines of the budget allocation being determined on the basis of this; and (iii) as a result of the foregoing two reforms, the number of regular employees in stores was reduced and the proportion of part-timers rose.

(1) The Switch to Profit Centers and the Policy Matrix

Hitherto, Company A did not mind incurring costs in order to increase sales at its stores (revenue centers), but as a result of the management reforms, each store was given a profit target (profit centers). Accordingly, in order to increase profits, each store had to reduce costs, while at the same time increasing sales, and as a result, Company A cut the number of regular employees in its stores, and increased its reliance upon part-timers.

Furthermore, in conjunction with the switch to profit centers at the store level, the company embarked upon a program aimed at achieving greater efficiency in regard to manpower and budgets. The policy matrix shown in Table 3 was introduced to this end. This policy matrix is a mechanism in which all of Company A's stores were classified into nine categories according to the scale of the store and its turnover, with the allocation of personnel and budgets being determined according to each store's classification. It was what could be described as a policy of selection and concentration in terms of manpower and

Table 4. Changes in the Total Number of Regular Employees and the Number of Regular Employees at Stores

(1) FY1992–FY2004

	FY												
	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Total number of regular employees	-94	-228	47	-76	135	42	16	-54	-15	3	56	-38	-9
Number of regular employees at stores	-108	-131	60	-26	8	7	-7	-50	-4	-45	51	9	-19

(2) FY2006–FY2009

	FY2006	FY2007	FY2008	FY2009
Total number of regular employees	60	30	-20	-20
Number of regular employees at stores	50	110	70	100

Source: Compiled from materials distributed by the personnel department at Company A.

Note: The materials on which Tables 4 (1) and (2) are based differ, so they have been compiled as separate tables. Figures could not have been calculated for FY2005.

budgets. For example, there is a great need for cost management among the small stores, so their budgets for labor costs and the manpower available to them are restricted, leading to a fall in the number of regular employees (and thus a rise in the proportion of part-timers). In contrast, large stores are forecast to make a profit, so they receive larger allocations in terms of manpower and budget for labor costs. Thus, through this mechanism, Company A determines the broad outline of the budget for labor costs and the manpower at each store.

(2) Decline in the Proportion of Regular Employees at Stores

Let us now look at changes in the total number of regular employees at Company A and the number of regular employees at its stores. Tables 4 (1) and (2) were compiled on the basis of materials distributed by the personnel department at Company A. It should be noted that the same data have been divided into two tables, with Table 4 (1) displaying data up to FY2004, while Table 4 (2) displays data from FY2005 onward. This is because they were compiled on the basis of separate materials. In both sets of data, the number of people during the fiscal year in question has been deducted from the number in the previous fiscal year; accordingly, this means that positive values show that the number of people has declined since the previous fiscal year, while in contrast, negative values actually indicate that the number of people has increased during the fiscal year in question.



Source: Compiled from data distributed by the personnel department at Company A.

Figure 1. Before Reducing the Number of Regular Employees

From Table 4 (1), one can see a trend in which, if the total number of regular employees increases, the number of regular employees at stores also increases, whereas if the total number of regular employees falls, the number of regular employees at stores also falls. In other words, the total number of regular employees and the number of regular employees at stores fluctuate in the same way, so one can see that increases in the number of regular employees at stores are behind any increases in the total number of regular employees at Company A.

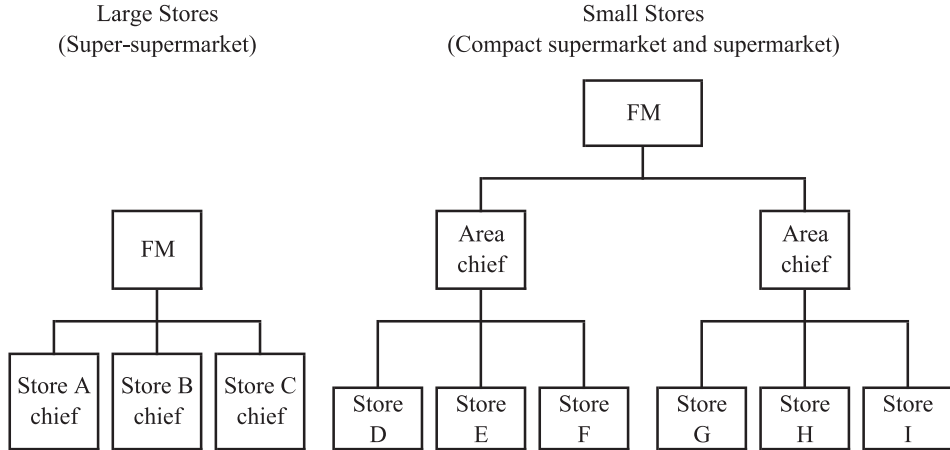
Looking next at Table 4 (2), one can see that it shows a different trend from that noted above. In FY2006 and FY2007, the total number of regular employees declines compared with the previous fiscal year, but the figures rise again in FY2008 and FY2009. In contrast, the figures for the number of regular employees at stores are positive in all fiscal years, showing that the number of such employees declined each year. Thus, one can see that Company A reduced the number of regular employees at stores following the management reform.

Next, let us look at an explanation of why the number of regular employees at stores was reduced in this way. Figure 1 shows Company A before it cut the number of regular employees. In order to make it easier to explain, the diagram shows one chief, who is a regular employee, in each store.⁶ There are nine stores, from Store A to Store I, and a chief is deployed in each, so there are nine regular employees in stores at that stage.

In Figure 2, FMs and area chiefs have been introduced. FM stands for “Field Man,” and they are head office employees. The FMs travel around the stores and check whether they are being run in the way that head office has decided they should be run. The area chiefs are regular employees affiliated to a store. At this stage, the chiefs at the six stores from Store D to Store I have been abolished and replaced with two area chiefs, so there are now five regular employees at stores. Compared with Figure 1, the number of regular employees at stores has been reduced by four.

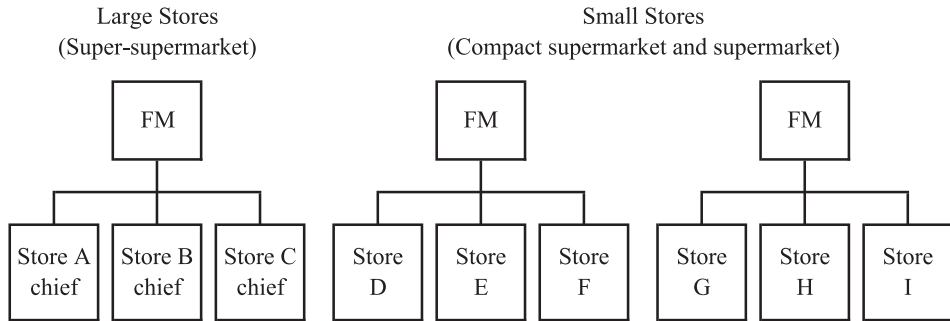
Figure 3 shows the current situation, now that area chiefs have been abolished. There are now three chiefs left, in the large stores only, meaning that the number of regular employees in stores has been cut to three from the five in Figure 2, when it was originally nine,

⁶ In fact, Company A’s stores have a number of different departments, such as fresh fish, meat, fruit and vegetables, groceries, and the bakery. The chief is the person in charge of each department, so each store actually has several chiefs.



Source: Same as Figure 1.

Figure 2. Institution of FMs and Area Chiefs



Source: Same as Figure 1.

Figure 3. Abolition of Area Chiefs

as shown in Figure 1. Through this process, the number of regular employees at stores has been cut as the head office of Company A has strengthened the degree of central control. So who is carrying out their jobs instead? As will be described below, it is part-timers who are taking on their work.

2. The Formulation of the Budget for Labor Costs

The corporate planning office at Company A draws up a first draft as a springboard for discussion of the labor costs budget. The corporate planning office firstly determines the operating profit that is the company's target, and then decides on the turnover and costs that will be needed in order to achieve that target. Following this process, the total labor cost for Company A is broadly determined.

Once the corporate planning office has drawn up this first draft, it is passed to the sales directors who manage the stores. Each of the sales directors has a number of stores under his/her jurisdiction, so he/she revises the first draft in partnership with the store managers that he/she manages. However, apparently it is basically impossible to change the figures set forth in the first draft. This is because, if costs are increased, it will become difficult to achieve the operating profit target. The only way that the target can then be achieved is to achieve a higher level of turnover, etc., so increasing costs just means that stores are tightening the noose around their own necks. The first draft revised by the sales directors and store managers is returned to the corporate planning office, with the revisions being reflected in the finalized labor costs budget. Once the labor costs budget has been finalized, it is conveyed directly to each store by the corporate planning office.

Thus, the labor costs budget for Company A is determined in the process of deciding upon the respective figures, by calculating backwards from the operating profit that is the company's target. These figures are decided on the basis of performance during the previous fiscal year and one can see that financial indicators have a significant impact on decisions concerning the total labor cost at each store.

3. Manpower Management

Let us now take up the issue of manpower management at Company A. The number of regular employees hired by Company A is determined on the basis of trends in the number of retirees and people leaving their jobs for other reasons, as well as the plan for opening new stores. However, as there are currently no plans to open any new stores, the company is maintaining the status quo in terms of the number of regular employees to be hired. So how does it decide on the deployment of regular employees and determine the number of part-timers and how they will be deployed?

This is determined on the basis of the man-hour standard. Table 5 shows the man-hour standards for the fresh fish department. The figure for man-hour sales shows the turnover per employee (including both regular employees and part-timers) per hour. The man-hours, number of regular employees and man-hour sales are set for each average daily turnover category. The man-hours/day figure represents the total daily working hours of regular employees and part-timers.

Looking at the smallest average daily turnover category (the first row, for average daily turnover of less than ¥250,000), one can see that total daily working hours of 18.5 hours have been assigned. In the fresh fish department, there is one regular employee and the daily working hours of a regular employee are 6.2 hours, so one can see that the total daily working hours of a part-timer in the fresh fish division in question are 12.3 hours (18.5 hours - 6.2 hours). The store decides between how many part-timers these 12.3 hours should be divided and how many hours should be allocated to each part-timer. Naturally, it is possible to utilize all of these hours, but if a store wishes to reduce labor costs even a little, it is

Table 5. Man-Hour Standards (Fresh Fish Department)

Average daily turnover (¥1,000)	Man-hours/day	Number of regular employees	Regular employees/day	Man-hour sales
0 ≤	18.5H	1	6.2H	10,391
250 ≤	21.5H	1	6.2H	12,151
300 ≤	27.5H	2	12.4H	12,091
:	:	:	:	:
1,300 ≤	59.5H	4	24.8H	21,555
1,400 ≤	59.5H	4	24.8H	23,151

Source: Based on the third survey (June 10, 2010).

Note: Man-hours/day indicates the total number of working hours per day.

possible to have part-timers work fewer hours than this.⁷

4. Coordination of the Labor Costs Budget and Manpower Management

As described above, in the process of regulating manpower management based on the labor costs budget, Company A decides on the use of non-regular employment. However, a major problem can arise in doing so based on the aforementioned mechanism. This problem is the fact that while a large share of the available staff and budget is allocated to stores that are performing strongly, there is a possibility that those which are not will have their staffing levels and budgets cut.

How is Company A dealing with this issue? Company A strives to coordinate the staff required on the floor and the labor costs by means of the following four methods.

Firstly, it diverts a portion of the budgets for other business costs within the store to labor costs. The store budget has been approved by the head office, so it is possible to make adjustments to accommodate costs within a single store, as long as it remains within the overall scope allotted by the head office.

Secondly, the sales director exercises his/her discretion. The sales director has his/her own budget provision for personnel costs arising from part-timers, so can allocate part of that budget at his/her discretion.

Thirdly, it is possible to make adjustments between stores within the same sales division. Each sales director is responsible for multiple stores, so the important thing is to be able meet the targets for the sales division as a whole. Consequently, it is possible to set higher targets for a highly profitable store to obtain extra labor costs budget and divert a portion thereof to stores with lower profitability.

⁷ However, as Company A is cutting the number of regular employees and part-timers at stores to the absolute minimum necessary, there is considerable downward pressure on the labor costs budget each year, and the budgets allocated to stores are becoming quite tight.

Fourthly, there is the option of appealing for a larger budget based on the actual circumstances of the store. For example, if there are circumstances that cannot be overcome through the store's own efforts alone, such as having poor road access and rival stores opening nearby, a store can submit an appeal describing those circumstances and seek an accommodation on this basis.

5. The Expansion of the Scope of Jobs of Part-Timers and the Cultivation of Their Skills

(1) The Expansion of the Scope of Jobs of Part-Timers

This section examines what has happened as a result of Company A reducing the number of staff, with a particular focus on regular employees. To put it briefly, as a result of efforts to achieve greater staffing efficiency, some stores found that there were times when they were short-handed, so the scope of jobs of part-timers on the shop floor effectively expanded. In addition, coupled with the establishment of part-timers as a significant workforce at Company A, this trend brought about their qualitative utilization. The following looks at this in more specific terms, starting with the expansion of the scope of jobs.

Under normal circumstances, the careers of regular employees and part-timers at Company A are based on a specific division (i.e. a product group, such as fresh fish, meat, fruit and vegetables, bakery, etc.). Consequently, unless they are in a managerial post, such as that of store manager, employees tend to work in a specific division for a long time. However, at some of Company A's stores, efforts to make staffing numbers more efficient resulted in there being times when the stores are short-handed. There were occasions when long queues formed, resulting in part-timers working in the fresh fish department who were not otherwise occupied having to work on the cash register. In other words, the lack of manpower brought about an expansion of the scope of jobs of part-timers.

A further major problem arises here. This is the problem of the treatment of part-timers. The personnel treatment system for part-timers (i.e. the part-timer qualification system) at Company A was based on the premise of carrying out jobs within a single department, so it did not envisage any circumstances in which a part-timer might work outside that department and a situation arose in which part-timers were not rewarded for helping with the work of other departments. Consequently, the following requests emerged from the shop floor. The following are all statements obtained from interviews conducted by the personnel department at Company A.

“For example, if it was someone from the fresh fish department, they are only qualified to deal with fresh fish, but at our store (a small store), there are fresh fish staff working on the cash registers. We are having to get people who have only dealt with fresh fish to operate the cash registers, so I wondered whether it might not be possible to give them some kind of reward for this. That's why we decided to establish quali-

fication categories for multiple tasks.”

“The qualification system (the part-timer qualification system) was originally designed for single departments, but with the number of staff at stores being reduced, the need to work across several departments has arisen. On the other hand, we also received requests from the sales team, saying, ‘We want to work across several departments, so please create that kind of qualification,’ so we ended up changing it.”

Thus, the scope of jobs of part-timers expanded and stores made requests for their treatment to be amended to accommodate this, so the personnel treatment system for part-timers was revised.⁸ However, it is not the case that this instantly led to the qualitative utilization of part-timers. This is because, whereas the expansion of the scope of jobs indicates a horizontal spread of jobs, qualitative utilization signifies that abilities or the content of a job grow in a vertical direction. Consequently, for part-timers to be qualitatively utilized, it would be necessary for Company A to embark upon the development of its part-timers. This would mean cultivating the skills of part-timers at Company A.

(2) The Cultivation of the Skills of Part-Timers

Table 6 shows the content of revisions of the system carried out in 2003. Before the system was revised, there were four ranks: FP (Fresh Partner), Senior FP (Senior Fresh Partner), LP (Leader Partner), and CP (Career Partner). FPs carried out simple routine tasks, Senior FPs carried out jobs to assist the person in charge of the department, LPs deputized for staff, while CPs carried out jobs as the sub-chief. In the 2003 revisions of the qualifications of part-timers, these were compressed into three roles.

After the revision of the system, the roles of FPs and Senior FPs were merged and, as a result of CPs and LPs taking on more senior roles, FPs began to take on non-routine tasks. More specifically, they now take on the jobs involved in assisting the person in charge of the department for which Senior FPs had hitherto been responsible, and also deputize for staff, which had been the role of LPs before the revision. LPs are still expected to deputize for staff, so it seems as though there was no change from their role hitherto, but they are now given the authority to carry out jobs as the sub-chief, for which CPs had been responsible until that point. In the same way, there was no change in the fact that CPs carry out jobs as the sub-chief, but after the revision, they also have the authority to carry out the jobs of the departmental chief. In other words, at the same time as compressing the ranks of part-timers, Company A embarked on a program of cultivating the skills of part-timers by

⁸ Based on the FY2005 figures, the average annual income of part-timers was ¥1.18 million, while it was ¥2.7 million for LP and over ¥3.9 million for CP. Naturally, annual income for part-timers increases as they rise through the ranks. Moreover, the annual income of CP is higher than that of the company’s regular employees (over ¥3.8 million for regular employees in their mid-20s who have been working there for 2-4 years continuously).

Table 6. Changes in the Part-timer Qualification System at Company A (2003 Revision)

	Role before the revision	Change	Role & jobs in future
CP	Sub-chief jobs Someone to whom one can entrust a range of management tasks, from planning to sales in the department in question, with complete peace of mind.	Sub-chief jobs Expanded to include everything up to and including departmental chief jobs	Running the department, management tasks After mastering a range of jobs within the department, will carry out jobs involving making judgments, such as sales planning and personnel management (non-routine).
LP	Deputizing for staff Someone who is well-versed in their jobs and can carry out tasks based on instructions from the person in charge when that person is absent.	Deputizing for staff Expanded to include everything up to and including sub-chief jobs	Running the department when the chief is absent After mastering a range of jobs within the department, will carry out some jobs involving making judgments, based on instructions from the chief (non-routine).
Senior FP	Assisting the person in charge of the department Those skilled in their jobs	Assisting the person in charge of the department Expanded to include everything up to and including deputizing for staff	The current tasks carried out by FPs and FPSs will be incorporated to form a single basic category, with the basic level being raised. Will be well-versed in basic routine tasks, skilled in their jobs, and able to carry them out reliably. Will carry out jobs including some non-routine tasks (routine tasks + non-routine tasks), due to the granting of greater responsibility to part-timers in career and leader roles
FP	Simple routine tasks Those who are able to carry out their jobs reliably, as stipulated in the manual and textbook.		

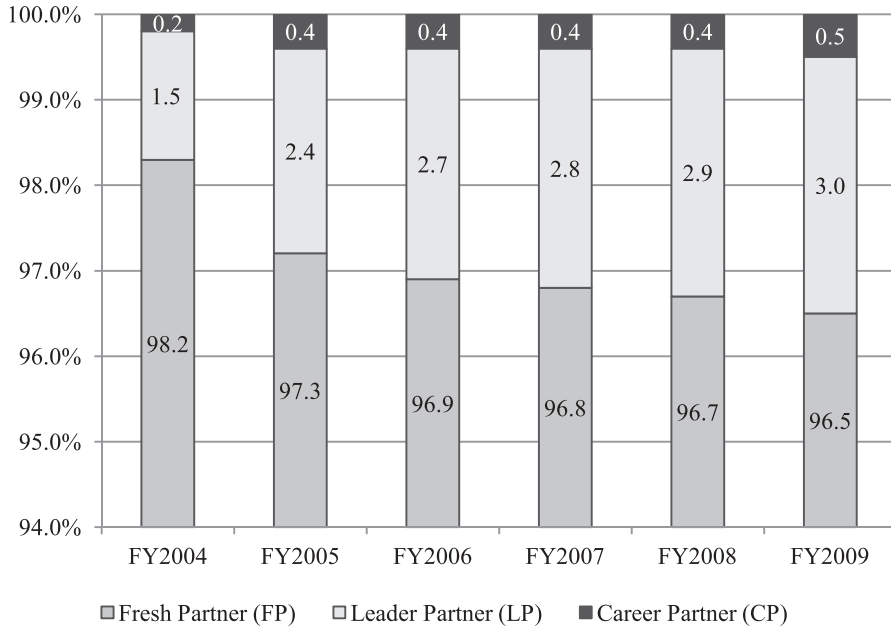
Sources: Compiled from Company A Personnel Department, *Fresh Partner Qualification System Guidebook* (2000 revision, page 2), and *Partner Qualification System Guidebook* (October 2003 revision, page 1).

Notes: 1. Bold type added by the author of this paper. These sections indicate aspects that were changed as a result of the revision of the system.

2. FP stands for Fresh Partner, LP for Leader Partner, and CP for Career Partner.

raising the overall level of part-timers, with a particular focus on FPs.

However, if Company A had truly made a start on cultivating the skills of its part-timers, the figures for the number of CPs and LPs as a proportion of the total number of part-timers should both have increased. According to Figure 4, amid a reduction in the total number of part-timers (see Table 4 [2]), whereas the proportion of FPs has been gradually reduced, the proportion of LPs has been growing since FY2005, while the proportion of CPs



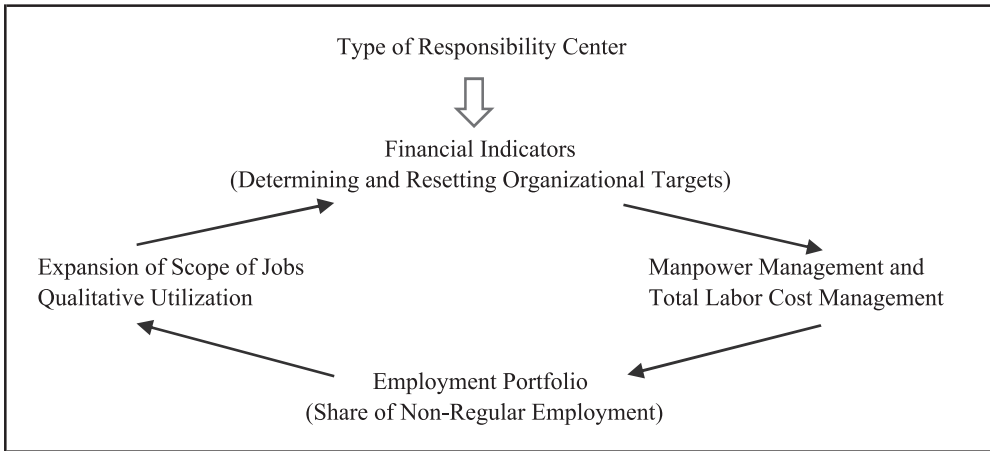
Source: Partial revision of Figure 2-5-2 from Japan Institute for Labour Policy and Training (2011, 57).

Figure 4. Changes in the Proportion of Part-timers at Company A (%)

has also increased, albeit just a little. In other words, the cultivation of the skills of part-timers at Company A has progressed steadily.

In addition, a limit has been set for the number of CPs and LPs, with each department having a maximum of two of these. Consequently, if there are two CPs and LPs within the same department at the same store, the third person becoming a CP or LP will be ordered to transfer to another store. At Company A, when a part-timer is to be promoted to CP or LP, they are only promoted after consenting to the possibility that they might have to transfer elsewhere, so that no problems arise as a result of a transfer.

Thus, it has become clear that, due to a reduction in the manpower, including part-timers, as part of the company's efforts to manage the total labor cost, the scope of jobs of part-timers in stores expanded, leading to requests for improvements in treatment, as a result of which the treatment system was revised to correspond to the actual situation amid which part-timers were working. Moreover, coupled with the fact that it sought to cultivate the skills of part-timers at the same time, this led to the qualitative utilization of part-timers at Company A.



Source: From Japan Institute for Labour Policy and Training (2011, 152).

Note: Arrows indicate the influence one aspect has on another.

Figure 5. Mechanism behind the Increase in Non-Regular Employment

III. Conclusion

Finally, let us look at the conclusions that can be drawn from this. We can draw the following four conclusions from the case study of Company A.

Firstly, there is the mechanism behind the increase in non-standard employment. At Company A, the employment portfolio is organized in the process of determining the deployment of manpower at each store, based on the management of the total labor cost. This is the mechanism that brought about the increase in non-regular employment that is the subject of this paper (Figure 5). According to this, at Company A, the total labor cost for regular and non-regular employees is decided upon based on financial indicators, with the employment portfolio at each store being determined within that scope. To put it another way, the employment portfolio at each supermarket store is determined after the fact, based on the management of the total labor cost and manpower management, rather than being grounded in a management strategy or HRM strategy.

Secondly, there is the fact that the roles, scope of jobs and skill levels required of those in non-regular employment are determined on the basis of the aforementioned mechanism. When manpower management is carried out with an emphasis on the labor costs budget, while the number of regular employees, who entail expensive labor costs, is reduced, it is not the case that the workload also declines, so stores are forced to increase their degree of reliance on part-timers. As a result, this has an impact on the roles, scope of jobs and skill levels required of those in non-regular employment. The prime examples of this are the expansion of the scope of jobs of part-timers and their qualitative utilization. However, in the

case of some of the work of regular employees, the quality of part-timers must be increased in order for them to be an acceptable substitute. Company A achieved this by cultivating the skills of its part-timers.

Thirdly, there is the development of a personnel treatment system for non-regular employees, undertaken in the process of cultivating the skills of those in non-regular employment. The treatment system for part-timers at Company A was revised in response to requests from stores. One factor behind this response by Company A was the fact that it had invested in the education of part-timers before embarking on the qualitative utilization of those in part-timers. Accordingly, it sought to ensure that those in non-regular employment became firmly established as part of the company, in order to recover the cost of that training. This is because, if non-regular employees leave their jobs, the company becomes unable to recover the cost of training them and it incurs additional training costs because it has to train a new part-timer.

Fourthly, there is the fact that the proportion of those in non-regular employment is forecast to increase in due course. If the mechanism behind the increase in non-regular employment forms a single cycle, as shown in Figure 5, it is anticipated that the use of non-regular employment will progress and the proportion accounted for by those in such employment will increase further in the future.

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The Japan Institute for Labour Policy and Training (JILPT) is engaged in various activities based on the Third Medium-Term Program (from April 2012 to March 2016). In the field of research activities, JILPT has carried out research projects on the following themes, which relate to the medium and long-term labor policy issues, with the participation of a broad range of talent within and outside the Institute.

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This research studies comprehensive and strategic labor/employment policies from a cross-sectional point of view.

Research on Employment/Labor in Response to Changes in Economic and Social Environments in Japan

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Research on the Vocational Capability Development System in Response to Economic and Social Changes

Amid changes in employment practices and types, as well as in vocational capability development at the educational stages, this research seeks to define ideal vocational capability development and evaluation systems and ideal means to connect education to vocational careers.

Research on Support for Lifetime Career Development and Promotion of Employment

This research examines actual circumstances and problems from the perspective of offering lifetime support for career development and promoting employment so as to allow people to realize enriched vocational careers.

Research on Companies' Employment Systems and Personnel Strategies, Improvement of the Quality of Employment through Development of Employment Rules, and Realization of Decent Work

This research ascertains the present status of companies' management strategies, their personnel management in response to changes in employment structure, and changes in overall employment systems, and promotes studies on how to improve the quality of employment through promoting work-life balance.

Research on the Mechanism for Establishing Terms and Conditions of Employment, Centering on Labor Management Relations

This research examines the current status of labor management agreements and collective agreements in Europe, where collective bargaining systems have been working nationwide at the industry level, as well as issues of workplace harassment, which symbolizes the individualization of labor management relations.

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