

## Study on the Current Status of Employment among the Elderly Summary

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**1. Period of research**

Fiscal 2009-2010

**2. Objectives of research**

Population in Japan has been falling since 2005, and in line with further progress of declining birthrate, it is expected that Japan will become a real depopulating society. Within a few years, the “*dankai*” or “baby-boomer” generation will enter its late 60s, leading to anticipated structural changes within the working population and an impact on public pension finance. Also, there is concern about a range of future problems including potential restrictions on economic growth resulting from shrinking labor force, problems with the financial aspect of pensions due to the decrease in the pension support ratio, and declining social vitality, etc., not only at the micro-level of individual lifestyles of elderly people, but also at the macro-level of the social economy as a whole.

Against this background the Japan Institute for Labour Policy and Training (JILPT), as instructed by the Minister of Health, Labour and Welfare, conducted a research as part of its second mid-term period project (FY2007-2011), entitled “Research and Study of a Society in which All Demographics Could Participate in a Time of Population Declines.” As a result, JILPT has been engaged in a study on the development of a working environment that will promote the participation of elderly people, women, young people and all other people in employment, thereby securing the working population into the future, and maintaining or improving the vitality of Japanese economic society.

In particular, the impact on the labor market of the “baby-boomer” generation reaching 60 and then 65 years of age, and the phased raising of pensionable age for the fixed amount and earnings-related components of public pensions, have significantly changed both the employment and living environments. Furthermore, with the increase in the rate of elderly population, from the viewpoint of how to reduce the burden of medical costs, pension costs and social welfare on the young, and how to ensure the fairness among generations, it has become important to secure employment of elderly people, and it is required to establish a structure whereby elderly people shift from a position being supported by society to a position supporting society, enabling them to maintain motivation in life and to utilize their skills.

In order to achieve this, this project research established the “Research on Promotion of Employment among the Elderly” as one of its main sub-themes. Ahead of other sub-themes, the Study Group on Employment Promotion of the Elderly was established in fiscal 2007, with Atsushi Seike, President of Keio University, as its Chair. With cooperation from various JILPT and external researchers, the project has initiated study on how to create an environment in which elderly people can keep their motivation, exert their abilities and continue to work regardless of their age. (Research period: fiscal 2007-2011).

Of this project, the details of research carried out in fiscal 2009-2010 are as follows.

During fiscal 2009, JILPT implemented an individual “Survey on the Employment Status of the Elderly,” following on from its surveys of companies during fiscal 2008. The aim of this survey was to grasp the current situation of employment and work of the elderly both from the viewpoint of companies and workers, and furthermore, to understand the awareness and lifestyles of elderly people, and to facilitate multi-dimensional and empirical analysis of the problems relating to the employment of elderly people. The Research Group discussed the design, etc., of the survey over a

period of time.

During fiscal 2010, detailed analysis was carried out based on the data collected from these individual surveys, in order to understand awareness of employment and employment patterns among elderly people, as well as the state of, and factors that regulate employment and lifestyles, and the relationship between employment and public pension systems, etc.

Specifically, as the most urgent is the measure to address the raising of the pensionable age for public pensions such as employees' pensions, we identified and analyzed the issue from the perspective of the connection between pensions that give economic support to the lifestyles of pensioners, and employment. The major focus was on old-age employees' pension for active employees, which is conventionally considered to have restricted employment. Consideration was given to changes in impact after the revision of the system, the state of utilization of systems for early payment of pensions that make up a lack in earned income for elderly people and the effect of such systems, the specific impact on the household budgets of the elderly of raising the pensionable age, and the functions of legal measures to secure employment for the elderly (including analysis of additional effects of raising or abolishing the retirement age).

Next, based on the importance of specific management of companies in ensuring the continued employment of the elderly, analysis was carried out to ascertain awareness and behavior of individual elderly people, and their relationship to employment management and other issues within companies. The major focus was on factors that regulate levels of satisfaction with work and the impact on the intention to leave work among elderly people, and the effects of education and training for elderly employees on their earned income and labor supply, for elderly people continuing in employment beyond the age of 60.

In addition to this, various simulations were carried out on the financial aspects of employees' pensions, to understand the relationship between future employment and pensions. Furthermore, in order to contribute to the consideration of elderly employment and employment strategies in Japan in the future, international comparisons were made with the current state of employment and work among elderly people in European countries.

### **3. Outline of research results**

Among a number of large debates regarding the employment and work of elderly people, this report focuses particularly on securing employment up until the age of 65, and on their lifestyles. It uses the aforementioned JILPT's individual "Survey on the

Employment Status of the Elderly,” to analyze the main issues.

This analysis gave the following results, particularly with a focus on policy implication.

### (1) Summary

#### 1) State of lifestyles in the early 60s (relationship between employment and pensions): The need to secure employment, and institutional responses

Recent amendments to the Act on Stabilization of Employment of Elderly Persons have led to some substantive progress in the employment and work of elderly people. At the same time, however, many people are still forced to retire when they reach retirement age. It is feared that among these non-employed elderly people, a large proportion will, in the future, face difficulties in making a living in their early 60s as they cannot receive a pension due to the raising of the pensionable age.

One way of dealing with this is to utilize the early payment systems for the basic pension payment. As analyzed in Chapter 1, however, analysis of elderly people actually utilizing the early payment systems shows that the poverty rate is relatively high among those utilizing these systems, which suggests that this method is not necessarily successful in assisting them to maintain a household budget.

For this reason, there is a need to promote measures to secure employment for the elderly. Chapter 2 analyzes and assesses the effect of employment security measures based on the amended Act on Stabilization of Employment of Elderly Persons in securing household income for elderly people. It was found that where employment security measures have been widely adopted and raised the rate of employment, there are lower numbers of elderly people with insufficient income, and that furthermore, among various employment security methods, raising or abolishing the retirement age is particularly effective.

In the future, as the pensionable age is raised to 65, from the perspective of household expenditure, it will be vital to ensure employment for elderly people, to guarantee that they can attain a certain level of earned income, and to ensure that measures to secure employment for the elderly are thoroughly implemented. Among other things, it is particularly important to take measures to proceed the raising or abolition of retirement age.

## **2) Issues for consideration in corporate human resources management**

- i. It is thought that satisfaction levels with work in older age are a significant factor from the perspective of maintaining employment among elderly people. If this is true, some consideration will be required within corporate human resources management. According to the analysis contained in Chapter 3, satisfaction with work is impacted by workers' own awareness of whether or not their wages match the work they are doing, while at the same time the less satisfied with work, the more workers will be inclined to leave their jobs, showing a negative correlation between satisfaction with work and desire to leave a job. This suggests that if wages for continued employment drop too low in comparison with wages paid prior to retirement, the workers' satisfaction with their job is reduced, and they will be more inclined to leave their jobs. In consideration of ensuring workers remain in the company, the issue of how to establish wage systems for elderly workers in relationship to both pensions and job performance will be an important one.

In terms of job satisfaction, those engaged in clerical jobs were more satisfied than those engaged in other types of job, and in general, women expressed a higher level of satisfaction although the difference was not significant among older women. Also, satisfaction was higher among those with a spouse or partner than among those without.

- ii. Furthermore, the issue of how vocational skills development impacts the employment of elderly people is also important in human resources management. Analysis results in Chapter 4 show that initial differences in human capital (educational history, etc.) impact access to educational and training opportunities, through to old age, thereby widening the gap in human capital throughout an employee's working life. In other words, disparity in human capital (such as educational history) when employees enter a company have an impact on access to education and training opportunities beyond the age of 55 as well, and receiving education or training beyond the age of 55 has a positive correlation to earned income in old age. For this reason, in terms of human resources management it appears important to support human capital development by continually providing equal opportunity for education and training over a long vocational life-span – from entering a company onwards.

## **3) Financial verification and supplementary material**

- i. Public pensions (employees' pensions) play an important role, alongside

employment, in stabilizing the lifestyles of elderly people, and the project carried out financial verification of these. Analysis in Chapter 5 takes a more practical and conservative simulation of labor force participation rates, etc. based on Ministry of Health, Labour and Welfare's 2009 Actuarial Valuation of the Employees' Pension Insurance and National Pension, and demonstrates that it will be difficult to achieve an ideal balance of pension savings, as envisaged by the Actuarial Valuation, in 100 years' time.

Furthermore, a desired level for pension payments that our individual survey of elderly people reveals would inevitably lead to the financial difficulty in pension system. Measures may include the raising of pensionable age to 67 and the reducing of the amount of cash paid as pensions and instead providing medical and nursing care by way of performance in kind in order to give a sense of security in old age.

- ii. In considering future employment policy of the elderly, we have referred to the current status and examples in European countries, which are ahead of Japan in the implementation of measures. As is stated in the supplementary material, European countries are pressing ahead with legislation toward an age-free society, raising the pensionable age to 67-68, promoting flexicurity that combines labor market flexibility and employment/social security, the framework of lifelong education and training systems, and implementing measures that promote inter-generational work sharing and lifelong work-life balance. In reference to these measures, it will be important to work towards the formation of a workplace in which workers are remunerated not according to their age but according to their abilities, and the realization of a society in which education and training opportunities are offered regardless of age.

## **(2) Outline of each chapter**

The report comprises a preface, five chapters and supplementary material.

Firstly, Chapters 1 and 2 discuss the issues relating to the connection between employment and pensions which support the household income of elderly people.

Next, Chapters 3 and 4 analyze the awareness and behavior of individual elderly people in relation to employment, and corporate management in response to this.

In addition to this, Chapter 5 presents analysis of the relationship between employment and pensions from a macro perspective, and the supplementary material presents trends and other new information from European countries. The following is a summary of each chapter.



## 1) Chapter 1: Connections between employment and pensions – Analysis of employment controls and early payment of pension benefits

Methods used to secure income by people in their 60s who have worked throughout their lives as employees have altered significantly subsequent to 2000, alongside changes to the employment and pension systems. As a result of this, the six major patterns used to retain income in the early 60s, in combination with payment of social security benefits (specially provided old-age employees' pensions) are as follows:

- i. earnings-related component
- ii. earnings-related component + early payment of basic old-age pension (partial): (from age at which fixed amount component begins, + additional pension for dependents)
- iii. earnings-related component + early payment of basic old-age pension (full): (from age at which fixed amount component begins, + additional pension for dependents)
- iv. Old-age pension for active employees + earned income (where recipient is insured by employees' pension insurance)
- v. Old-age pension for active employees + earned income + benefit for continuous employment of old persons (adjusted for concurrent payments, where recipient is insured by employees' pension insurance)
- vi. Basic allowance from employment insurance (payment suspension of old-age employees' pension)

As described above, the income security patterns of people in their 60s have diversified, and the issue of how to ensure a smooth connection between restrictions to or the ending of employment and the beginning of pensions, as well as that of how to ensure the stable maintenance of household income, are the major issues.

The objective of this chapter is to conduct analyses of (i) the controlling effect of old-age pension for active employees on employment, and (ii) the early usage of payment system of basic pension for people qualified to receive old-age employees' pension benefits, utilizing individual data from the 2009 "Survey on the Employment Status of the Elderly" in the analysis.

In principle, people in their early 60s will, if they are unable to work, face difficulties in retaining income after 2013. At present, the pensionable age for the fixed amount component of the public pension has been raised, but the earnings-related component can still be paid, and as a result, the issue of problems in income security for people who are unable to work has not yet come to the fore. Nonetheless, A look at the type of people utilizing the system for early payment of basic pension, may help consider policy issues

relating to income security by elderly people after 2013.

The abolishment of across-the-board 20% payment suspension of old-age pension for active employees and the early payment system of basic old-age pension are both relatively recent changes, and therefore, hardly any quantitative analysis of their effects has been made so far. The analysis in this chapter is thought to be the first attempt at verification of these effects.

The analysis results in this chapter gave the following three findings.

Firstly, no effects of old-age pension scheme for active employees were verified in terms of controlling employment (except for the results for some respondents aged 63 and 64).

The analysis used the Heckman model to estimate an employment probability function and a market wage function. The scope of the estimate was men aged 60-69, who were employees of private companies at the age of 55, and the employment probability function indicates partial differential coefficients. The controlling effect of old-age pension for active employees on employment was estimated based on whether or not the respondent was a qualified recipient of old-age employees' pension.

The results showed that no controlling effects of old-age pension for active employees could be verified on employment (despite the fact that such effects were confirmed in data for 1983 and 2000). Coefficient of recipient qualification of old-age employees' pension on employment probability is negative, and not significant even in the significance level of 10 %. This indicates that between the ages of 60-69, the state of being qualified to receive an old-age employees' pension does not reduce the employment probability. It was found that other non-work-related income than employees' pension, however, still shows effect in controlling employment. The results above demonstrate the potential impact of the changes to the system of old-age pension for active employees (abolishment of the across the board 20% payment suspension, and the raising of the pensionable age for the fixed-amount component of special old-age employees' pensions, leading to a reduction in the portion of stopped payments).

Secondly, of all people qualified to receive an old-age employees' pension, those making use of the early payment system are highly likely to have experienced unemployment subsequent to leaving a job at retirement age. In other words, they have lost earned income against their will, and their employment and pension have not been seamlessly connected.

The analysis utilized a multinomial logit model.

In terms of liquidity control factors (factors caused by lack of cash reserve), which are

considered factors to prompt the early payment of basic pensions, we clarified that the probability of people choosing early payment rises by 10% if a person experiences unemployment after retiring or leaving work aged 55 or older. This means there is a possibility that people after the age 55 for whom employment and pensions have failed to be connected will be more likely to take advance redemption of pensions.

On the other hand, factors that promote the deferred payment of pensions at a later date include the experience of retirement, which increases the probability by around 4%. In cases of people who leave work before the pensionable age for payment of the fixed amount component of their pension, and who experience unemployment or moves out of the workforce subsequent to leaving work, such cases are shown to lower the probability of deferred payment of pensions by between 3-4%.

Thirdly, the research estimated the income levels of people using the early payment system for basic pensions. Converting the relative poverty line published by the Ministry of Health, Labour and Welfare in 2006 (=50% of median income) to 2009 values, gives an estimated definition of relative poverty equivalent to a monthly income of less than 108,000 yen as of July 2009. This gives a relatively high figure of 13% of people living in relative poverty who are taking early payment of basic pension, and when taken in combination with the raising of the starting age for the remuneration-related part of the pension in 2013, and it indicates that the early payment system of basic pension may not in fact be a cure-all for income retention to make up for the income loss after the raising of the pensionable age for earnings-related component in 2013.

According to this analysis, the rate of relative poverty among people taking early payment is higher than that of people taking deferred pension payments, or those taking neither early nor deferred payments. In other words, the relative poverty rate among people taking deferred pension payment is 0%, and among those taking neither early nor deferred payments is 4%, making the 13% rate among people who are taking early payment approximately three times higher than that among those taking neither early nor deferred payments.

## **2) Chapter 2: Household income after the raising of the pensionable age, and the function of measures to secure employment for the elderly**

In fiscal 2013, the pensionable age for the fixed amount component of employees' pension will be raised to 65 and that for the earnings-related component of the pension will also begin to rise, so that by fiscal 2025, no person in their early 60s will in fact be eligible for pension payments. Based on this, there is now an urgent demand for all companies to implement measures to ensure the provision of employment for all workers

up to the age of 65.

This chapter looks at the methods used to generate household income among elderly people, mainly in their early 60s, and analyzes the need (or otherwise) for employment income when the pensionable age is raised to 65, along with the function of measures to secure employment for the elderly (raising of retirement age, continuous employment (re-hiring or extended employment) or elimination of retirement age). The data used was individual data from the “Survey on the Employment Status of the Elderly,” which asked elderly people in their early 60s about their household expenditure, income (earned income, pension and other unearned income), assets (net savings = savings – loans), etc. in order to analyze applicable measures to secure employment for elderly people and the state of retirement, using cross tabulation and distribution scales.

Firstly, based on the analysis results using cross tabulation, it was shown that without an employees’ pension, income is lower than household expenditure, and around 15% of people could not make up the difference even if they used up their net savings.

Those respondents whose income would be insufficient without an employees’ pension had an average monthly deficit in income of 120,000 yen. Compared to those whose income was sufficient without an employee’s pension, these people did not have specific differences in household expenditure. Despite the fact that their pension income was 70,000 yen higher, their earned income was 160,000 yen lower per month. It can be seen that a lack of employment income is the main reason that household expenditure cannot be met without an employee’s pension.

One reason for the low earned income among such people is the low rate of employment. Only 32% of people with insufficient income were employed, while 75% of those who did not report insufficient income were in employment.

It is thought that this differential in rates of employment is caused by the difference in the state of implementation of measures to secure employment for the elderly. When compared according to whether or not they had been subject to measures to secure employment for the elderly, 27% of those who had reported insufficient income were subject to such measures, a significantly lower figure than the 44% of those who had not reported insufficient income. Furthermore, the proportion of respondents who had hoped for but not achieved continued employment (those who had requested continued employment (re-hiring or extension of employment) but been turned down, or whose place of work did not have a continued employment system in place) was 20% among those who reported insufficient income, significantly higher than the 9% of those who had not reported insufficient income. It is thought that a disparity in the implementation of measures to secure employment for the elderly is behind the low rate

of employment.

In addition, of those whose income was insufficient, 46% were engaged in part-time employment, a high rate compared to the 20% of respondents who did not report insufficient income. The average income of those engaged in part-time employment was approximately 140,000 yen, significantly lower than those engaged in regular employment, whose average income was around 270,000 yen.

The difference in proportions of people in part-time employment is thought to demonstrate the impact of differences in the implementation of raising or abolishing the retirement age. Only a tiny proportion – 3% – of respondents reporting insufficient income had worked in a workplace that raised or abolished its retirement age, far lower than the 20% who did not report insufficient income. From a different perspective, of the people who had not had their retirement age raised or abolished, 25% were in part-time employment, while only 11% of those who had experienced a raised or abolished retirement age were in part-time employment.

In this way, the employment income of elderly people in their early 60s is higher for those subject to measures to secure employment for the elderly, and particularly those for whom the age of retirement has been raised or abolished. The extent of this is considerably high, even when compared using linear regression analysis to the impact of attributes such as age, gender and educational history.

The facts stated above, however, in regard to respondents who stated that they could not meet their household expenditure without an employees' pension, are based on averages, and in fact their income and other factors vary widely among individuals. For this reason, we used a quasi-Gini coefficient and quasi-relative dispersion (quasi-square variable coefficient) to calculate the disparity in income, and the contribution ratio of earned income, employees' pensions and other factors to the disparity.

The results of this analysis show that raising the pensionable age to 65 results in a larger disparity of income, but that improving employment rate through measures to secure employment for the elderly has a significant impact on reducing this disparity.

The contribution ratio of employees' pension to this disparity in income (quasi-relative dispersion) is negative at -0.023. If pensionable age is raised to 65, this negative impact disappears, resulting in a larger disparity in income, leading to an increased possibility that some people will have a significant lack of funds to pay for household expenditure. This is the same for disparity in the difference between income and household expenditure (excess or lack of income), with such disparity also increasing when pensionable age is raised to 65.

In order to regulate this expansion in income disparity, it is important to reduce

disparity in earned income, through promoting employment among elderly people. We looked at the impact of employment situation on disparity in earned income based on the quasi-relative dispersion. Assuming that an increase in measures to secure employment for the elderly resulted in a reduction in disparity of earned income between working and non-working elderly people equivalent to the level of disparity between working and non-working elderly people who had been subject to such measures, in a trial calculation, the contribution ratio on income disparity is -0.048, showing a reducing effect, which is greater than the effect on widening disparity in income caused by raising the pensionable age to 65 (0.023). This trial calculation is based on the assumption that all employees of all companies wishing to work until 65 could do so, but demonstrates that a further implementation of measures to secure employment for the elderly would have a significant impact on reducing disparity. The results are the same when the disparity in difference between income and household expenditure is calculated.

Furthermore, if trial calculations are performed, assuming that the raising or elimination of retirement age resulted in a reduction in disparity of employment income between those working part-time jobs and those working regular jobs to the level of those for whom retirement age has been raised, the level of impact (contribution ratio) on income disparity is shown to be -0.013, demonstrating that raising the retirement age can contribute to a reduction in disparity. The results are the same when the disparity in difference between income and household expenditure is calculated.

As shown above, there is a concern that when pensionable age is raised to 65, there will be a certain proportion of elderly people whose income is lower than their household expenditure, but it is anticipated that this problem can be improved if measure to secure employment for the elderly are further implemented. Furthermore, among different measures to secure employment for the elderly, the raising or elimination of retirement age is considered to be the most effective.

Measures to secure employment for the elderly have become more common for subsequent generations, reflecting the stepwise raising of the compulsory age of pension payment. There is a need for further promotion of activities to ensure that such measures to secure employment for the elderly are thoroughly implemented in all corporations for people aged up to 65.

### **3) Chapter 3: Factors influencing elderly people's satisfaction with work, and those that impact their decisions to leave work**

This chapter uses the individual data from the "Survey on the Employment Status of the Elderly," and performs quantitative analysis of data from groups of employed people

aged 55-59, 60-64, and 65-69 to establish the factors influencing elderly people's satisfaction with work, and those that impact their decisions to leave work. The analysis process initially used a Maddala model to estimate a working hours coefficient, after which working hours were estimated based on this working hours coefficient, and these estimated values were used in order in a logit model to analyze levels of satisfaction with work. Furthermore, probit analysis was performed in relation to decisions to leave work.

The results of this analysis into factors affecting levels of satisfaction with work showed that in all age groups, in comparison with the group that responded their wages were "just right" in relation to the work they were doing, those that responded that their wages were "too low" had low levels of job satisfaction, indicating that subjective judgment affects job satisfaction. This impact was shown to be greatest in the group aged in their late 60s.

Next, the following points were confirmed regarding factors that lead to a decision to leave work.

- i. Among all groups (those aged 55-59, 60-64, and 65-69), the higher their level of job satisfaction, employees were less likely to decide to leave work.
- ii. A comparison of the work being done and wage levels showed that in all age groups, in comparison with the group that responded their wages were "just right" in relation to the work they were doing, those that responded that their wages were "too low" were more likely to make a decision to leave work.
- iii. The impact of educational levels on job satisfaction among employees in their 60s was not significant, but among the group in their late 50s, compared with those that had a moderate level of education (those who were high school graduates), those who had a higher level of education and those who had a lower level of education both demonstrated higher levels of desire to leave their jobs. It is thought that both the relationship between wages and the recovery of educational investment, and the mental health aspect, affect these results.

These verification analysis results are considered to have the following policy implications.

- i. All age groups (those aged 55-59, 60-64, and 65-69) demonstrated clearly that the lower their levels of job satisfaction, the higher the likelihood becomes that they will decide to leave work. For this reason, in order to promote employment among the elderly, it will not be sufficient to merely raise employment rates. Rather, priority must be given also to ensuring the job continuity of elderly people (their retention

within the company). This indicates that companies must address the issue through the creation of human resources management systems, and improvements in working conditions, to raise levels of job satisfaction.

- ii. In all age groups, in comparison with the group that responded their wages were “just right” in relation to the work they were doing, those that responded that their wages were “too low” had low levels of job satisfaction. Furthermore, it was also confirmed that, when job satisfaction and other factors are kept equal, in comparison with the group that responded their wages were “just right,” those that responded that their wages were “too low” were more likely to make a decision to leave work. This indicates that, when companies implement continued employment for elderly people, lowering wages excessively leads to low levels of job satisfaction, which increases the likelihood that these people will leave work. In consideration of the issue of job satisfaction, we can see that the establishment of a wage system for elderly people that is in line with pension and the work being done is an important issue within corporate human resources management.

The authors would like to point out as challenges to be solved that the aspect of corporate information (labor demand) should also be considered as well as the possibility that volume of work and relationships in the workplace might impact job satisfaction.

#### **4) Chapter 4: The impact of education and training on the employment income of elderly people and labor supply**

In this chapter, verification analysis is carried out on the impact of education and training on the employment income of elderly people and labor supply. The main significance of focusing on education and training, within preceding research, was in verification analysis using educational history, job type and other factors as proxy indicators for human capital. Sufficient verification analysis relating to the impact of education and training on elderly people has not been carried out, and in order to propose a policy, it is considered important to understand the impact of education and training on labor supply and employment income levels among elderly people.

The purpose of this chapter is to utilize individual data from the “Survey on the Employment Status of the Elderly,” and to perform quantitative analysis to clarify the following three issues.

- i. The sort of factors that impact workers in undertaking education and training. Specifically, verification of the concept that “the higher the level of general human capital, the more likely it is that education and training will be undertaken after the



- age of 55, if all other conditions are equal” (issue 1)
- ii. The impact of education and training on the employment income of elderly people. Specifically, verification of the concept that “among people in their 60s, if all other conditions are equal, those who undertook education and training after the age of 55 have a higher level of employment income, compared with those who did not” (issue 2)
  - iii. Whether or not education and training promotes labor supply among elderly people. Specifically, verification of the concept that “among people in their 60s, if all other conditions are equal, those who undertook education and training after the age of 55 are more likely to be in employment, compared with those who did not” (issue 3)

The analysis procedure involved firstly the use of a probit model to analyze the probability of people undertaking education and training, and consider issue 1. Secondly, the Heckman two-step estimation was used to estimate an income coefficient for elderly people, and the impact of education and training on employment income was clarified in order to consider issue 2. Thirdly, a probit model and a multinomial logit model were used to analyze decisions to work and choices of employment formats among elderly people, and consideration was given to the extent to which education and training impacts labor supply among elderly people (issue 3).

The major findings of this analysis was as follows.

Firstly, the greater the level of general human capital (educational history) held by a worker, the more likely it is that the worker will undertake education or training after the age 55. From the view point of long-term career development, there is a possibility that the disparity in levels of human capital at the start of peoples’ careers may continue to expand, via a subsequent disparity in investment in education and training, into old age.

In terms of educational levels, compared with high school graduates, the probability that junior high school graduates will undertake education and training was 3-4% lower, while the probability that graduates of junior colleges or technical colleges /universities or graduate schools will undertake education and training was 4.6% and 5.4% higher respectively.

Furthermore, in terms of the impact of type of job, compared with those engaged in clerical work, there was a 5.7% increased probability that those in specialist or technical jobs would undertake education or training after the age 55.

Secondly, if other conditions are equal, it was confirmed that people undertaking

education or training after age 55 are more likely to have higher employment incomes in their 60s.

In terms of the impact of education and training, the estimated income coefficient value for people undertaking education after the age 55 was +0.209-0.219, and had a level of statistical significance of 1%. The issue of whether or not “among people in their 60s, if all other conditions are equal, those who undertook education and training after the age of 55 have a higher level of employment income, compared with those who did not” (issue 2) was verified.

In terms of the impact of educational history, if all other conditions are equal, the income level of graduates of universities and graduate schools in their 60s was 20% higher than that of high school graduates. This indicates that the income of elderly workers with higher levels of general human capital is higher and is in agreement with the theories of human capital.

In terms of the impact of the type of job, income levels were higher for workers in specialist, technical and management areas than those in clerical jobs. If other conditions are equal, compared to those respondents who did not change their type of job after the age of 55, those who did change their type of job had lower income levels during their old age (60s) by 15.6~17.0%. Type of job is, in the broad definition, a type of human capital, and since changing job type equates to loss of human capital, it is thought that this contributes to lower wages in old age.

Thirdly, the impact of undertaking education and training after the age 55 on decision to work or selection of an employment format was not statistically significant, but the analysis confirmed that education and training had a positive impact on the probability of employment during old age.

The impact of undertaking education or training after the age of 55 on the probability of being employed during old age was not statistically significant, but the estimated value of the dummy coefficient for undertaking education or training showed a positive value. This allows us to infer that undertaking education and training after the age 55 has a positive effect on employment among elderly people. It should be noted, however, that the reasons that the impact on employment rates among elderly people is not certain are that the sample size was small, and that it was not possible to look at the long-term benefits of education and training – including corporate education and training and self-development – up until the age of 55.

In terms of the impact of educational history on employment probability, compared with high school graduates, there was a 14.4% higher probability that graduates of junior college or technical colleges would be employed, but the estimated values for the

university/graduate school dummy were not statistically significant. Workers who were graduates of universities or graduate schools had higher levels of general human capital, but it is not always the case that they are more likely to be employed in old age. The reasons for this are that wages in the labor market for people with high levels of education are high, and there is in general a significant drop in wages in the market for such people after they retired, as well as the fact that the pensions of such people tend to be higher, meaning that the wages to prompt people with higher levels of education to choose to work are comparatively expensive.

In terms of the impact of retirement age systems on employment probability, those who have undergone retirement are 11.1% less likely to be employed in old age, compared with people who have not. The inference is that the experience of retirement lowers the labor supply among elderly people.

The analysis results above confirm that undertaking education and training after the age 55 leads to higher levels of employment income in one's 60s. Furthermore, although not statistically significant, it is possible that education and training has a positive impact on the probability of employment for elderly people. In addition, in order to deal with the problem of significant falls in wage levels among elderly people subsequent to retirement, and to promote their employment, the results indicate that a certain level of effect can be obtained from educational investment policies for middle-aged and elderly employees (for example, public-sector professional training and/or vocational training within companies).

##### **5) Chapter 5: The public pension system as seen in the “Survey on the Employment Status of the Elderly”**

This chapter uses the “Survey on the Employment Status of the Elderly” to consider the financial aspects of public pension systems, in particular, the relationship of employees' pension to employment and lifestyle among elderly people.

The simulations focused on the following three points.

- i. Based on actuarial conservatism in pension insurance, verification of labor force assumptions relating to employees' pensions contained in the Ministry of Health, Labour and Welfare's 2009 Financial Verification entitled “Review of the 2009 Actuarial Valuation of Public Pension Plans.”

Although the Financial Verification contains some problems with assumptions of Interest Rate, this study verifies the labor force participation rate and other assumptions that are at the core of said verification. The process for Financial Verification includes assumptions based on levels of employment considered

difficult to achieve unless Japan's economy demonstrates significant growth, so in this study, the verification of hypotheses relating to the labor force participation rate is based on actuarial conservatism.

- ii. Among the categories included in the "Survey on the Employment Status of the Elderly," simulations were conducted to determine pension costs and financial revenue and expenditure based on ideal levels on public pension benefit in old age.

The survey looks at living standards in old age, and the proportion of pensions required to support them, and uses this data to consider the possibility of implementing an ideal pension level. It considers what would happen if ideal pension levels, as defined theoretically by individuals, could be achieved.

- iii. Slimming down pension payment, and its effect

The results of the questionnaire survey showed that respondents wished for a significantly higher level of pension payments. Once people reach old age, they have insecurities relating to illness and welfare care, and vague anxiety regarding their economic future. In many cases, this motivates people to save. In particular, vague anxiety for the future are the cause of "preventive" savings. For this reason, simulation was implemented that involved slimming down the cash payments within pensions, and paying a portion of pensions in "kind" through medical or welfare care, to see to what extent the capital within a pension could be paid in "kind." Doing this, in addition to slimming down pension finances, could reduce the need for "preventive" saving, and therefore stimulate consumption, bringing possible economic benefits.

Specifically, all the simulations above use program and data used in the Financial Verification. For detailed results of the simulation, please see the full report. The following provides an outline of these results.

Firstly, various assumptions regarding labor force, labor force participation rates and employment rates, which were used in the Financial Verification hypothesis, were relaxed from the point of view of actuarial conservatism, and simulation was carried out assuming a labor rate in the midpoint between that based on maintenance of the current situation, and that based on the Financial Verification hypothesis. The estimated period was between 2005 and 2105, and other assumptions were based on median fertility, mortality, and economic scenario.

As a result, in Financial Verification, the "reserve ratio" at 2105 (the ratio of the reserve fund at the end of the previous fiscal year to the expenditure of each fiscal year) was set not to fall below 1, but in our simulation, it did fall below 1.

Secondly, simulations were carried out to establish the hoped-for cost of living in old age and its proportion to be covered by public pensions for households (people with spouse, unmarried, divorced or bereaved). The “Survey on the Employment Status of the Elderly” showed that for households of a married couple, the average hoped-for cost of living per month was 273,531 yen, and the proportion of these costs it was hoped would be covered by public pensions was 71.1%. Meanwhile, in households with single people (including divorced or bereaved), the average hoped-for cost of living per month was 202,595 yen, and the proportion of these costs it was hoped would be covered by public pensions was 66.9%.

Comparing the results of the simulation with the actual amount of pension benefit, we carried out estimates in reference to the shortfall for each household type. In order to improve the balance of income and expenditure and to keep the “reserve ratio” 1 or above in 2105, it was shown that the insurance premium rate should be raised to around 35%.

Thirdly, as a method of slimming down pension payments, trial consideration was given to the American “bend-point” system and the Canadian “claw-back” system for calculating pension benefit. Both systems have incorporated prior income guarantee functions into pension systems, but at the same time, they have strong redistribution functions for income.

We implemented simulations based on three different assumption patterns, adjusting the American and Canadian methods so that they apply to Japan’s situation. As a result, in terms of to what extent the pension payment would be controlled, the American method gave similar results for all three patterns, and on average, offered savings equivalent to 5 trillion yen. On the other hand, the Canadian method gave savings of 6, 8 and 11 trillion yen depending on each of the three patterns, respectively. This indicates that the latter two patterns using the Canadian method would allow the current cost of long-term care to be almost completely covered.

#### **6) Supplementary Material: Issues with recruitment and employment policies for elderly people in Japan – realizing a high-quality, diverse recruitment and employment environment for elderly people up to the age of 70**

Recent amendments to the Act on Stabilization of Employment of Elderly Persons have led to some progress in the employment of elderly people, but as the ageing society progresses, and with the raising of the pensionable age to 65 in FY2013, the issue requires further and more substantive responses. This material deals with these conditions, in reference to recruitment and employment policies for the elderly in various European countries, and provides recommended objectives, from the perspective

of the author for recruitment and employment strategies for elderly people in Japan. For information on these views, please refer directly to the full report. This summary includes basic information regarding trends in various other countries, mainly Europe.

Trends in Europe and the USA include measures to prohibit age discrimination across a range of aspects relating to employment, not only recruitment and hiring, with the exception of regulations relating to retirement that are synchronized to the pensionable age. Such trends have begun to sweep through developed countries. In some countries based on British and American law – USA, Canada, Australia and New Zealand – mandatory retirement systems are prohibited at any age. Within EU countries, EU Council Directive 2000/78/EC of 27 November 2000, establishing a general framework for equal treatment in employment and occupation, requires all member countries to enact a law prohibiting age discrimination. Sweden prohibits retirement before 67. Various countries prohibit retirement systems that come into force before pensionable age, while others do not regulate minimum retirement age. Furthermore, in the United Kingdom, the current default retirement age of 65 (the age at which the employer can force retirement if there is a justifiable reason) was in principle abolished as of April 2011. The reasons for this abolishment include factors relating both to health maintenance among elderly people and the benefit to society, as well as the relative reduction in the population of productive age due to an ageing society, and the fact that many people cannot achieve sufficient levels of income subsequent to retirement.

Regarding the pensionable age, in the future, various EU countries will raise these to between 67 and 68 (Germany: 67, UK: 68, Denmark: 67), and many other countries have begun serious considerations of this policy.

In terms of specific measures to promote the employment of elderly people within the EU, the Stockholm Summit in March 2001 determined that the target average employment rate within the EU of elderly people (aged between 55 and 64) would be raised to 50% by 2010. In fact, since 2000, the rate of employment among the elderly has risen steadily, and was rising according to target until 2008. Due to the Lehman Brothers shock in autumn 2008 and the subsequent financial crisis, however, employment rates have either stagnated or fallen in many countries.

When comparing this with the situation in Japan, and looking at the rate of support in Japan and Western Europe (population at working age / population of dependent elderly), we find, for example, that in Japan, it is estimated that in 2020, one elderly person (aged 70 or above) will need to be looked after by every 2.83 persons of working age (where “working age” is defined as between 20 and 70). The average figure for Western Europe in the same year is one elderly person for every 2.78 people of working

age (where “working age” is defined as between 20 and 65), demonstrating that Japanese people will have to work five years longer to achieve the same standards as those available in Western Europe.