

How employment affects the elderly's subjective well-being

Mingyu Jiang*

Graduate School of Economics, Kobe University

April 30, 2021

Abstract

Does being employed make the elderly happier? As industrialized countries implement elderly employment promotion policies and pension revisions, it is important to understand the consequences of such policies. This study investigates the effect of employment on the elderly's subjective well-being, based on Japanese nationally representative survey data (Japanese General Social Surveys: JGSS) from 2002 to 2012. To avoid bias, instrumental variables (IV) with Probit ordinary least squares (POLS) are used, with data related to the 2006 Elderly Employment Stabilization Law and pension revisions as sources of exogenous variations in employment. The POLS results indicate that employment increases satisfaction in family finances. However, the effects disappear after applying the IV-POLS approach. Furthermore, this study finds that the effect of employment on well-being varies depending on the employment status—regular or non-regular. However, the differences disappear after controlling for household income. These results suggest that there are both positive and negative effects of employment on subjective well-being, and the two cancel each other out.

keywords subjective well-being · employment · elderly · regular or non-regular · household income

*Email:jiangmingyu.econ@gmail.com

1 Introduction

In recent years, with the improvement of living conditions and the decline in birth rate, aging has become an important social issue. Many countries worldwide are facing a rapidly aging population, which leads to a shrinking number of workers and a growing social security solvency problem. To address this problem, countries have implemented various elderly employment promotion policies. In Japan, owing to its rapidly aging population, the government implemented the Elderly Employment Stabilization Law (EESL)¹ and the Pension Reform Act in 2006 to increase elderly employment. However, when promoting the elderly's employment, it is important to consider changes in individual well-being. This study assesses the effect of employment on the well-being of the elderly in Japan.

Does being employed make individuals happier? According to neoclassical economics, individuals maximize utility by choosing particular combinations of consumption and leisure. Individuals gain utility directly from leisure, while labor time has a negative effect on utility (Borjas and Van, 2010). However, with the increase in labor time, additional wages increase consumption, which leads to an increase in individual utility. Therefore, although labor time itself has adverse effects on utility, the increase in wages results in positive utility for individuals. However, when household income is controlled for, this effect is expected to disappear, and the labor itself could have adverse effects on utility.

This study examines the effect of continued employment after age 60 on the subjective well-being of the elderly. One hypothesis is that employment provides not only pecuniary benefits but also spiritual reward to people through social contact, occupational attachment, and individual identity. However, when perceived as being involuntary, employment may decrease the well-being of the elderly and is likely to decrease free time and increase physical and mental stress.

This paper is related to the extensive literature concerning the impact of retirement on the elderly's subjective well-being, in which empirical evidence is mixed, and either adverse, positive, or no effects are found. Charles (2004) uses U.S. data and finds a negative OLS estimator and a positive IV estimator. Based on the England data and using Regression Discontinuity Design (RD), Johnston and Lee (2009) indicates that retirement increases subjective well-being. Latif (2011) uses Canadian data and finds a positive impact on subject well-being. Horner (2014) uses international data from sixteen countries in Western Europe and the U.S. and also finds a positive

¹The Act on Special Measures Concerning Promotion of Employment of Middle-aged and Aged Persons of 1971 was revised many times. In 1986, the name was changed to the "Elderly Employment Stabilization Law." Companies were obliged to make an effort to hire older workers until they reached the age of 60. After that, with the 1994 amendment, enterprises were prohibited from setting the age of retirement before the age of 60. Then, after the 2000 amendment, employers were obliged to make an effort to employ the elderly until they reach the age of 65. In 2004, the Japanese government revised the EESL again and implemented the revision in 2006.

effect. However, based on Europe data, Fonseca et al. (2014) and Coe and Zamarro (2011) find that after controlling for endogeneity, no significant effect of retirement. Furthermore, Bonsang and Klein (2012) uses the Germany data and finds that retirement has a positive effect on satisfaction with free time, a negative effect on household income, and the average effect on life satisfaction is negligible. Although the literature above all addresses the endogeneity of retirement decisions by exploiting retirement policy changes, the results still turn out to be mixed. The mixed results may be due to differences in the definition of retirement. Alternatively, it may be due to differences in statutory retirement ages, post-retirement earnings, and social awareness, such as the socially acceptable retirement age or social norms across countries.

The main contributions of this study are as follows. First, it addresses the endogeneity of employment decisions in Japan. People with idiosyncratic low levels of well-being or those facing transitory shocks that adversely affect well-being might disproportionately select into retirement (Charles 2004). Moreover, unobservable factors may affect happiness and employment simultaneously. However, to our knowledge, none of the previous studies have addressed the causal effect in Japan. Previous studies have only examined the inferred correlation. Second, in examining the well-being of the elderly, it is vital to determine the impact on overall well-being, as well as the heterogeneous effects of job characteristics such as regular and non-regular work.

This study uses subjective well-being measures that are available in the Japanese General Social Surveys (JGSS). The POLS results indicate that employment increases satisfaction in family finances. However, the effects disappear after using the IV-POLS approach. Furthermore, this study finds that the effect of employment on well-being differs depending on the employment status (i.e., being a regular or non-regular employee). However, the differences disappear after controlling for household income.

The rest of this paper is structured as follows. 2 describes the institutional setting in Japan. Section 3 discusses the data and descriptive statistics, while Section 4 explains the identification strategies. Section 5 presents the empirical results, which are further discussed in Section 6. Finally, Section 7 provides the conclusions.

2 Institutional setting and international comparison

2.1 Description and international comparison of elderly employment in Japan

This section provides background information on Japan's macroeconomic situation in relation to changes in the employment rate for men aged 60–64 years before and after the 2006 EESL. From 2004 to 2005, the employment rate for men aged 60–64 years was around 65.5%. However, after implementation of the EESL and pension policies in 2006, the employment rate continued to

increase, rising to 72.5% in 2008, followed by a slight decline from 2008 to 2010 due to the financial crisis. However, the employment rate continued to rise again after 2011, with the latest data showing that the employment rate for men aged 60–64 years reached 81.1% in 2018.

Figures 2 and 3 provide a comparison of the employment rate of the elderly in Japan with those of the main Organisation for Economic Co-operation and Development (OECD) countries. Japan ranks first in terms of employment rate for men in both the 60–64 and over 65 years age groups, as compared with those of internationally representative OECD countries or the average of OECD countries from 2000 to 2018. One may wonder why the employment of the elderly in Japan is the highest. In Sections 2.2 and 2.3, this study provides two possible reasons. Considering Japan’s characteristics and its international representativeness, using Japan as the research subject can provide deeper understanding of the impact of employment on the elderly’s well-being.

[Insert Figure 1 here.]

[Insert Figure 2 here.]

[Insert Figure 3 here.]

2.2 The 2006 Elderly Employment Stabilization Law and pension revisions in Japan

According to the White Paper on the Aged Society², in the 1980s, Japan’s population ageing rate was lower than that of the other main developed countries and regions. However, after 1990, the ageing rate accelerated, and Japan transformed from an ‘ageing society’ (over 7% in 1970) to an ‘aged society’ (over 14% in 1994) in the space of 24 years. Against this background, the Japanese government implemented the revisions in relation to pensions and elderly employment.

The Pension Reform Act, reversed in 1994, had gradually raised the eligibility age from 60 to 65 for the basic part of the ‘special payment pension’³ for men by one year every two years from 2001. The revision for women applied five years later than for men, starting from 2006. As shown in Figure 4, for example, if a man was born in 1941 or 1942, he can start receiving the basic portion when he is 61 years old in 2002 or 2003, respectively. However, at this time, the mandatory retirement age was still 60, and there was a gap between the pension eligibility age and the mandatory retirement age. To close the gap, the EESL revision was implemented in 2006.

²Cabinet Office, Government of Japan: Aged Society White Paper data (Heisei 29th edition).

³The amendment of the law in 1985 gradually increased the eligibility age of welfare pension insurance from 60 to 65 years. To raise smoothly in stages the age of starting payment, the “special payment pension” system was established. Specifically, this amendment has two parts: a “basic part” and a “wage proportion part.” The basic part is determined by the number of months the person has paid the contribution., while the wage proportion part is based on both number of months the person has contributed and earnings before retirement.

According to this revision, companies were required to take at least one of the following measures: 1) increase the mandatory retirement age to the pension eligibility age; 2) set up a formal rule for employment extension (kinmu enchō) or reemployment (saikoyō); or 3) abolish the mandatory retirement age.

Figure 4 summarises how each revision applies to each cohort. The figure shows the timing of each cohort's eligibility age for the basic proportion part of their pension (under the 1994 pension revision). The parts within the dotted line are the cohort affected by 2006 EESL, under which companies are obliged to employ or make an effort to employ the elderly. As mentioned above, there is a five-year gap between the 1994 pension revision (implemented in 2001) and the 2006 EESL revision (implemented in 2006). We can see that the eligibility age for receiving the wage proportion part of the pension gradually increased for the cohort born after 1941, while the 2006 EESL only protected the cohort born after 1946. Put it more simply, for elderly men born from 1941 to 1944, although the pension eligibility age is 61 or 62, no employment protection is offered after the mandatory retirement age of 60. While the men born after 1946 are protected by the 2006 EESL revision, which obliges companies to employ them. Thus, we can compare those two groups to examine the effect of 2006 EESL revisions.

[Insert Figure 4 here.]

In Japan, many empirical studies have examined the effects of the 2006 revision of EESL. Regardless of the data source and method, all studies indicate that this law has effectively increased the elderly employment rate (Yamamoto, 2008; Kondo and Shigeoka, 2017). Yamamoto (2008) estimates the impact of the EESL using the Japan Household Panel Survey data and employs a difference in difference and a triple difference model. His results show that the employment rate of those aged 60–62 years rose by 12.4% to 15.3%. Kondo and Shigeoka (2017), using individual data from the Employment Trend Survey, estimate the EESL's impact by comparing cohorts affected by the 2006 revision (such as those born in 1946) with those who were unaffected (those born in 1945). They show that due to the revision, the employment rate rose by 2.4% to 3.2%. Furthermore, the impact of pension revisions on employment is slightly larger when combined with the EESL 2006 revision.

2.3 An international comparison of the elderly's work motivation

According to the 2015 International Comparative Study on the Lives and Attitudes of the Elderly Survey⁴ conducted by the Japan Cabinet Office, the proportion of 60-year-old elderly people in

⁴Japan Cabinet Office: Survey on 2015 International Comparative Study on the Lives and Attitudes of elderly (2015)

Japan who "want to continue a paid job in the future" is 68.7% compared with other major representative countries. This is higher than that in the United States (62%), Germany (50%), and Sweden (60.4%). Unlike other countries, Japanese people have higher work motivation, and the same is true for the elderly in Japan.

As mentioned above, Japan's social environment and the people's national consciousness are special, and it is difficult to predict the impact of the 2006 EESL and pension revisions on the well-being of the elderly. If the elderly were forced to work because of the reduction in pension income, employment would have a negative impact on happiness. However, if employment brings not only monetary income but also spiritual satisfaction, it may lead to more happiness for the elderly.

3 Data, definitions, and descriptive statistics

3.1 Data Sources

The empirical analysis is based on individual-level data from the 2002 to 2012 JGSS, which is a representative survey of individuals in Japan. The population of the survey is males and females between the ages of 20 and 89 years old and the subjects are selected by stratified two-stage sampling method. This dataset is ideal for the study because it has rich information about people's satisfaction with various aspects of life, including house life, income, and leisure. Moreover, the survey asks several detailed questions regarding employment status and demographics such as age, gender, marital status, and education, among others.

To investigate the effect of employment on the elderly's well-being, this study uses 2000–2012 individual-level data from the JGSS (see Figure 5). Since the survey was not implemented in some years, this study uses microdata for nine waves: yearly from 2000 to 2012 except for 2004, 2007, and 2011. Furthermore, given our interest, this study uses samples of men born between 1941 and 1950. This study also excluded observations with missing information on employment status, age, gender, and subjective well-being, leaving a sample of 592 individuals for the analysis.

[Insert Figure 5 here.]

3.2 Definitions

3.2.1 Dependent variables: Life satisfaction and happiness

Based on new welfare economics, utility is used to illustrate individual choices when facing various goods, and it can never be measured with a cardinal number. However, in theory, ordinal utility is used as an index of preference, which is far from substantive and empirically measurable subjective

well-being. Thus, in recent years, there has been a trend in economics whereby utility is measured, and a large number of empirical analyses based on individual data have appeared.

According to psychologists, “happiness” is a momentary feeling of joy and pleasure, referred to in psychology as positive and negative affect, while overall contentment in life is usually called “life satisfaction” (Nettle, 2006). In terms of the connotation of happiness and life satisfaction, although slightly different, most economic scholars consider them to be the same or similar (Frey et al., 2010; Frey et al., 2010; Tomioka, 2006; Urakawa, 2011). Specifically, Bok (2010) documents that groups of people are found to respond quite similarly when asked how happy or satisfied they feel about their lives. Thus, researchers tend to use the terms interchangeably. Based on the above, this study also considers happiness and life satisfaction as interchangeable indicators, using happiness as a proxy indicator of overall life satisfaction.

Furthermore, this study uses satisfaction in house life, family finances, leisure, and happiness as the outcome variables, for which respondents were asked how they would describe their satisfaction on a 5-point scale, ranging from satisfaction to dissatisfaction. For the analysis, this study reorders the answer by defining “dissatisfaction” as “1” and “satisfaction” as “5”.

3.2.2 Employment

There are two ways of defining employment: (1) being employed by a company and (2) either being employed in a company or being self-employed. This study adopts the first definition because employees are the target of the 2006 EESL and pension revisions, and they are the group most directly affected by the revisions.

3.2.3 Regular and non-regular workers

Even in the same state of employment, different employment statuses may have different effects. Regarding regular and non-regular employment, this study considers non-regular workers as temporary, daily, or part-time workers; those dispatched from temporary employment; contract employees; and temporary employees (shokutaku). Otherwise, they are considered regular workers.

3.2.4 Control variables: Equivalent income

This study controls for equivalent income in some of the specifications. According to the life cycle model, the effect of retirement on the satisfaction with free time is positive, while it is negative on the satisfaction with household income. The latter effect should disappear if the control for household income and the overall effect become small and positive. Furthermore, Frey, Bruno, and Stutzer (2010) state that it is important to distinguish between two quite different aspects of a job: a) intrinsic features, which relate to the conduct of the work itself, and b) extrinsic features,

which refer to the work conditions. Moreover, some researchers argue that intrinsic features more effectively satisfy innate needs than extrinsic features do and thus, contribute more to individuals' subjective well-being (Ryan et al, 1996). Therefore, this study does not control for the income variable in the first step of the analysis. However, in the second step, this study controls for the equivalent income to isolate the effect of work itself, as further discussed in section 5.2.

3.3 Descriptive statistics

Table 1 presents the summary statistics for all variables used in the analysis. The sample consists of 592 observations. First, regarding the individual characteristics, our sample comprises individuals aged 58–62 years with an average age of 59.568 years. In addition, since we use the items "60 or 62 years old" and "born after 1946" to examine the effect of the 2006 EESL and pension revisions, the statistical description of these items is also given in the table. The mean values of the two items are 41.9 and 53.7, respectively, which are around 50%, indicating that the control and treatment groups' sample sizes in the first stage of analysis are almost equal, which are ideal for examining the effect of the policies change.

Moreover, the vast majority (91.6%) have a partner. The treatment variables of interest are employed individuals, regular employees, and non-regular employees. About 61.7% of the individuals are employed: 55.1% are regular and 6.6% are non-regular employees. In addition, the mean for all satisfaction items is above 3. These individuals are more satisfied in terms of overall happiness and house life, which have scores above 3.5, while fewer individuals report satisfaction with leisure and family finances, which have scores less than 3.5.

[Insert Table 1 here.]

4 Identification strategy

4.1 Employment, regular employment, and subjective well-being

This study investigates the effect of employment on the elderly's subjective well-being. The traditional approach consists of estimating the following equation using OLS:

$$SWB_i = \alpha' L_i + \beta' X_i + \varepsilon_i \quad (1)$$

SWB_i represents a set of outcome variables that measure subjective well-being, such as satisfaction in house life, family finances, leisure, health, and overall well-being. L_i is a binary variable

denoting a salaried worker, and X denotes a set of predetermined variables, including marital status, education, health status, and a year dummy.

However, since employment might be endogenous to subjective well-being, the results might not imply a causal relationship. Specifically, there is the effect of employment on happiness, aside from the reverse effect of happiness on employment. Moreover, both employment and happiness may be influenced by unobserved factors. Thus, it is crucial to control for endogeneity in employment. We use instrumental variables (IV) with Probit ordinary least squares (POLS), in which we use a linear model to estimate the effect of policy modifications on employment and the probability of being employed in the first step and then used these estimates to control for the endogeneity in the subjective well-being equation (estimated by POLS). The method is similar to previous literature in the United States and the European Union (Charles, 2004; Bonsang et al., 2012; Fonseca et al., 2014).

The instruments need to meet the assumption that they are relevant to employment but have no impact on subjective well-being. Previous literature has shown the significant positive impact of the 2006 EESL and pension revisions on elderly employment (Yamada, 2007; Kondo and Shigeoka, 2017). For the first equation, we estimate the probability of being employed by exploiting the 2006 EESL and pension revisions as sources of exogenous variations in employment as follows:

$$L_i = \alpha + \beta cohort_i + \gamma age_i + \delta(age_i \cdot cohort_i) + \theta X_i + \varepsilon_i \quad (2)$$

Since the 2006 EESL revision and the social security revision in Japan are inextricably linked, one way to examine the effect of the two revisions simultaneously is to investigate them by cohort. To clarify the effect of the 2006 EESL and the pension revisions, we used a difference in difference approach, a method used in other studies that estimate this type of policy's effect. We can compare older men born between 1941 and 1945 (control group) with older men born between 1946 and 1950 (treatment group). We focus on their status at age 60 and 62—figure 4 shown how each revision applies to each cohort separately. At age 60, both the control group and the treatment group are in the same state, and neither could receive the basic proportion part of the pension. However, the treatment group is protected by the 2006 EESL, and firms are obligated to employ them. In addition, at age 62, the control group is receiving the pension, and is not protected by the 2006 EESL. The opposite was true for those in the treatment group. Thus, the coefficient then captures the effect of the 2013 EESL and pension revisions.

In Eq.(2), L_i represents employment status (i.e., employed or not, or a regular or non-regular worker). $cohort_i$ is a dummy variable indicating whether individual i belongs to the treatment group. $cohort_i$ equals 1 if individual i was born from 1946 to 1950, and zero if he was born from

1941 to 1945. age_i is a dummy variable indicating an individual's age; it equals 1 if individual i was 60 or 62 years old and zero otherwise. X_i represents characteristics such as "self-reported health status" and "marital status," with the "self-reported health status" equal to 1 if individual i was unhealthy, and zero otherwise, while "marital status" is equal to 1 if individual i was married and zero otherwise. Furthermore, we controlled for the effects of urban size, with the "Large town" equal to 1 if the city is a government ordinance-designated city⁵. Then, we retrieve correction terms about employment and add them in the second stage as follows:

$$SWB_i = \alpha + \beta \tilde{L}_i + \theta X_i + \varepsilon_i \quad (3)$$

The results are estimated in an instrumented regression as in Eq.(3). Our main variable, SWB_i , is one of the three outcome variables that measure individuals' subjective well-being. \tilde{L}_i denotes the values predicted from the first stage. In addition, it is particularly important to note that since age and cohort might be associated with subjective well-being, we also controlled for them in the second stage. captures the estimated effect of employment on the individuals' well-being.

As mentioned above, in the analysis of the effect of employment on subjective well-being, we use the IV-POLS approach, in which we used a line model in the first step. However, when it comes to the effect of employment status (i.e., being a regular or non-regular employee) on subjective well-being, the linear model is no longer applicable. Here, we followed Dubin and McFadden (1984) and used a two-stage procedure. We first adopted a multinomial logit in the case where the explanatory variable is being a regular employee or not to estimate the probability of being one of employment status.

$$E(\varepsilon_i | CF_i = i) = \sum_{j \neq i}^m \left(\frac{\hat{P}_j \ln \hat{P}_j}{1 - \hat{P}_j} + \ln \hat{P}_i \right) \quad (4)$$

$$SWB_i = \alpha + \beta \cdot CF_i + \lambda \cdot E(\varepsilon_i / CF_i) + \theta X_i + \varepsilon_i \quad (5)$$

More specially, the formulas for the correction terms are different from those of the line model when the first stage is a multinomial logit model. Following Dubin and McFadden (1984), the set of correction terms from a multinomial logit is obtained as in Eq.(4) Then, this study adds the set of correction terms as controls in Eq.(5).

⁵The government-designated city system requirements stipulated by Article 252-19 of the Japan Local Self-Governing Law are "a city with a population of 500,000 or more" and "designated by government ordinance." In addition to the population, the ability to carry out financial affairs and others are also essential conditions. Now there are 20 government ordinance-designated cities in Japan in 2021.

4.2 Probit Ordinary Least Squares

POLS, as an alternative to the ordered response model, has more advantages, such as requiring less computations and being more easily generalized into complex models. Moreover, it allows better handling of economic issues such as endogeneity and simultaneous equations. Furthermore, in most cases, it yields roughly the same results as the ordered probit. (Van Raage et al., 2004)

The specific calculation steps for the POLS method are as follows. The frequency and the cumulated frequencies for each category of the dependent variable $p_1, p_2, p_3, \dots, p_k$ are first calculated. Next, the corresponding Z-values of the standard normal distribution are determined based on the cumulated frequencies, and then the boundaries are calculated.

$$N(\mu_1) = p_1, N(\mu_2) = p_1 + p_2, \dots (6)$$

Taking the expectation of a standard normally distributed variable under the condition that it is in the interval between those two Z-values, the following equation is derived:

$$E(u|\mu_{i-1} < u_i \leq \mu_i) = \frac{n(\mu_{j-1}) - n(\mu_j)}{N(\mu_j) - N(\mu_{j-1})} \quad (7)$$

5 Results

5.1 The effect of employment on subjective well-being

Table 2 reports the results from the estimation of Eq.(1) by POLS. There is a weak significant positive overall effect of employment on satisfaction in family finances, and no significant effect on satisfaction in leisure, house life, and overall happiness. However, as previously mentioned, with POLS regression methods, the results may be biased due to endogeneity issues. People with idiosyncratic low levels of well-being or those facing transitory shocks that adversely affect well-being might disproportionately select into retirement. Thus, this can lead to biased upwards, and employment appears to increase the well-being of the elderly.

Tables 2 and 3 report the results from the estimation of Eq.(2) and Eq.(3), respectively. As shown in Table 3, the 2006 EESL and pension revisions have a positive effect on elderly employment, consistent with the results of Yamada (2007) and Kondo and Shigeoka (2017). This means that the IV is effective (see the table for the F-value). In addition, Table 8 shows that the estimation of instrumental variables (designed by interaction term of age and cohort) has no effect on subjective well-being, demonstrating the exogeneity of instrumental variables. All the IV esti-

mate implies no effect of employment on subjective well-being. Meanwhile, after controlling for endogeneity, the positive effects on satisfaction in household income disappear. In particular, the estimated coefficient for happiness is positive but not significant. Similarly, the estimates indicate a reduction in satisfaction in leisure, house life, and family finances, but the effects are also not significant.

The IV estimates on satisfaction in family finances are typically different from those of POLS, which suggests bias in the POLS estimates. As mentioned previously, the elderly with higher well-being levels are more likely to continue working after mandatory retirement age. Thus, POLS results could lead to an upward bias in the outcome, essentially a correlation rather than a causation relationship. The findings are in line with, for example, Fonseca et al. (2014) regarding retirement in Europe. In the next section, this study investigates regular and non-regular employees as treatment variables.

[Insert Table 2 here.]

[Insert Table 3 here.]

[Insert Table 4 here.]

5.2 The effect of regular or non-regular employment on subjective well-being

The employment status could potentially contribute to subjective well-being. As mentioned previously, the wages of regular employees are higher, which could lead to an increase in subjective well-being; however, non-regular workers have more flexible working hours. Moreover, it is important to note that unlike ordinary workers, the elderly may be unable to work for long periods due to their physical condition, and non-regular employment may be more suitable for them. Thus, this study further checks whether the impacts of employment on well-being vary between different subgroups.

The estimated treatment effects in Table 5 show that the 2006 EESL and pension revisions have a positive impact on employment, which is consistent with the results in Table 3. The estimated effect of regular employment on satisfaction in family finances is positive, indicating that regular employment increases the elderly's income, making them more satisfied with their financial situation. However, the results suggest that the impact of non-regular employment on house-life satisfaction and overall happiness are negative. It is important to note that this study obtains the overall effect of employment, which includes the income effect.

The results for regular and non-regular employees significantly differ in many aspects, especially wages and the nature of the work. Thus, differences in the effects between regular and

non-regular employees may be due to differences in income. By controlling for equivalent income, this study can isolate the impact of employment. As shown in Table 7, we find that the difference in the effects disappears after controlling for household income.

[Insert Table 5 here.]

[Insert Table 6 here.]

[Insert Table 7 here.]

6 Discussion

This study examines the causal effect of employment on subjective well-being. The POLS results indicate that employment increases satisfaction in family finances. However, the effects disappear after using the IV approach to control for endogeneity. As discussed in subsection 3.1, endogeneity issues due to reverse causality and omitted variables may bias the results. The results are consistent with Fonseca et al. (2014), who find no effect of retirement on subjective well-being after controlling for endogeneity using IV.

Furthermore, we find that the effect of employment on subjective well-being differs depending on the employment status (i.e., regular or non-regular employees). However, the differences disappear after controlling for the equivalent income.

The following can explain why employment has no impact on the elderly's subjective well-being after controlling for household income. According to neoclassical economics, after controlling for household income, labor itself could have adverse effects on utility. However, according to the new happiness economics, individuals derive utility not only from income and leisure but also from highly valued social relations, from self-determination, and through their own competence (Frey, Bruno, and Stutzer, 2008). Employment provides not only pecuniary benefits but also a spiritual reward to people through social contact, individual identity, and occupational attachment. Therefore, the negative effects of reduced leisure time might cancel out the positive effects of spiritual rewards, and thus result in no overall impact.

Generally, non-regular workers are not required to work full hours, allowing them more time for leisure, which has a positive effect on utility. Moreover, their work hours are more flexible. It is important to note that unlike other age groups, the elderly are less physically fit; thus, flexible working hours might be more suitable for their physical situation. According to a survey of the Japan Institute for Labour Policy and Training⁶, about 37.4% of male seniors aged 60–64 want to work for a short time instead of working full time after age 65. In summary, although regular employment gives workers higher wages, non-regular employment requires fewer working

⁶JILPT: Survey on Employment Life after Age 60

hours, which allows workers to adjust their working hours to their specific situation. Therefore, no differences were found.

7 Conclusion

This study investigated the effect of employment on the elderly's subjective well-being and examined whether the effect depends on job characteristics (i.e., regular and non-regular employment). It used the 2006 EESL and pension revisions as the sources of exogenous variables in employment and explored the impact of employment on the well-being of the elderly.

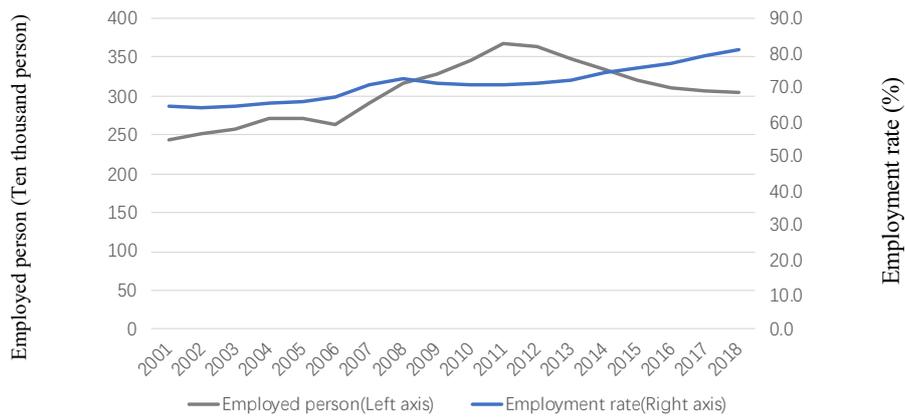
The study sheds light on the above-mentioned issues by specifically exploring the situation of the elderly in Japan. This study's topic has become an increasingly important policy concern for rapidly developing and aging Asian countries. Specifically, if employment reduces the elderly's subjective well-being, this implies significant policy cost. However, if employment has a positive or no effect on the welfare of the elderly, this might make elderly employment policies or pension revisions easier to implement.

The POLS results indicate that employment increases satisfaction in family finances. However, the effects disappear after applying the IV approach. Furthermore, this study finds that the effect of employment on well-being differs depending on the employment status (i.e., regular or non-regular employment). However, the differences disappear after controlling for household income. As stated previously, the 2006 EESL and pension revisions offer three choices for individuals and companies, and they choose according to their situation. Therefore, the revisions have no consequence on the subjective well-being of the elderly in Japan. With regard to the elderly employment promotion policies, the government should allow greater flexibility to provide individuals and companies with a wide range of employment options, such as formal or regular and non-regular or part-time statuses, so that the elderly can work according to their situation and companies can also adjust to their needs.

References

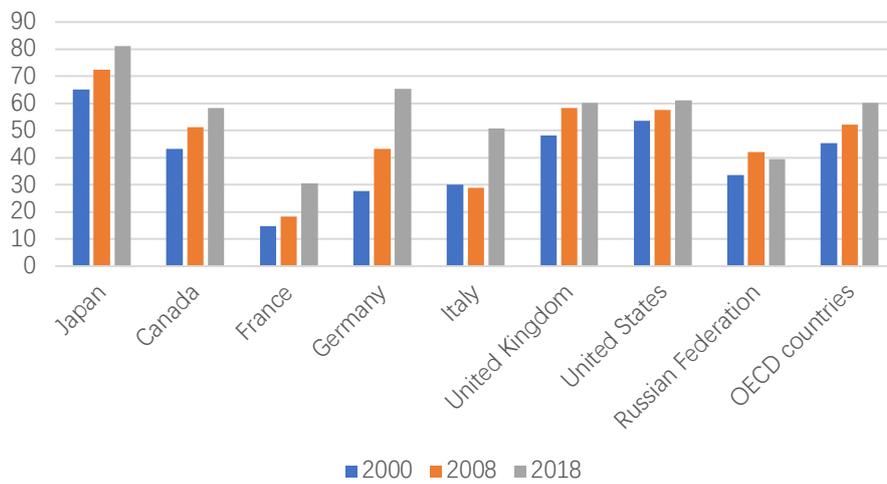
- Bonsang, E., Klein, T. J. (2012). Retirement and subjective well-being. *Journal of Economic Behavior Organization*, 83(3), 311-329.
- Bok, D. (2010). *The politics of happiness: What government can learn from the new research on well-being*. Princeton University Press.
- Charles, K. K. . (2004). Is retirement depressing?: labor force inactivity and psychological well-being in later life. *Nber Working Papers*, 23(04), 269-299.
- Dubin, J. A., McFadden, D. L. (1984). An econometric analysis of residential electric appliance holdings and consumption. *Econometrica: Journal of the Econometric Society*, 345-362.
- Fonseca, R., Kapteyn, A., Lee, J., Zamarro, G., Feeney, K. (2014). A longitudinal study of well-being of older Europeans: does retirement matter?. *Journal of population ageing*, 7(1), 21-41.
- Frey, B. S., Stutzer, A. (2010). *Happiness and economics: How the economy and institutions affect human well-being*. Princeton University Press.
- Frey, B. S. (2010). *Happiness: A revolution in economics*. MIT press.
- Horner, E.M. (2014). Subjective well-being and retirement: analysis and policy recommendations. *Journal of Happiness Studies*, 15(1), 125-144.
- Kondo, A., Shigeoka, H. (2017). The effectiveness of demand-side government intervention to promote elderly employment: Evidence from Japan. *ILR Review*, 70(4), 1008-1036.
- Latif, E. (2011). The impact of retirement on psychological well-being in Canada. *The Journal of Socio-Economics*, 40(4), 373-380.
- Nettle, D. (2006). *Happiness: The science behind your smile*. Oxford University Press, USA.
- Tomioka, J. (2006). The use of subjective data in labor economics. *The monthly journal of the Japan Institute of Labour*, 551(6), 17-31. (in Japanese)
- Urakawa, K. (2011). Current status of happiness research: prescription for uncertainty about the future. *The monthly journal of the Japan Institute of Labour*, 612, 4-15. (in Japanese)
- Van Praag, B. M., Van Praag, B., Ferrer-i-Carbonell, A. (2004). *Happiness quantified: A satisfaction calculus approach*. Oxford University Press.
- Yamamoto, I. (2008) "Analysis of the Effect of the Revision of the Elderly Employment Stabilization Law for Elderly People: Employment trend of people in their early sixties," in Yoshio Higuchi, Miki Seiko and Keio University Graduate School of Economics and Graduate School of Business Collaboration 21st Century COE, eds., *Dynamism IV of Japanese Household Behavior IV*, Tokyo Japan: Keio University Publications Press, 27-46. (in Japanese)

Figure 1: The employment number and rates of the elderly (men age 60 to 64)



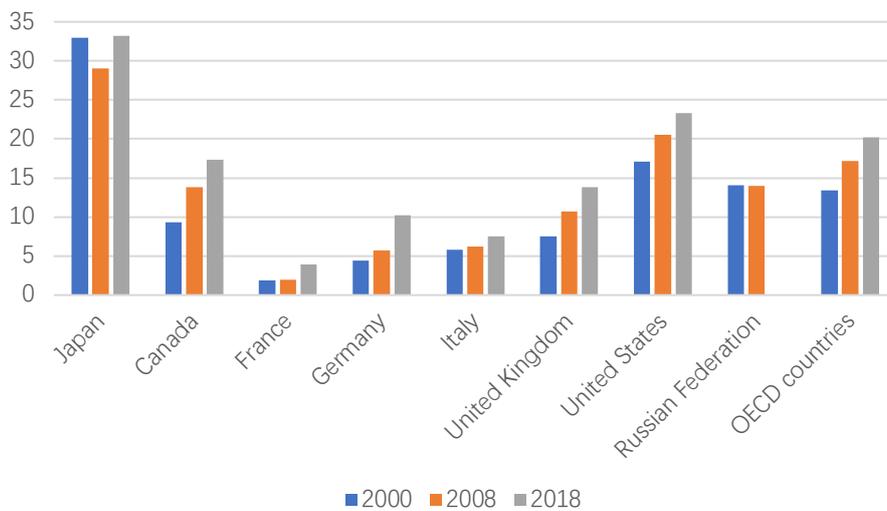
Source: Ministry of Internal Affairs and Communications: Labor force survey (long term time series data)

Figure 2: The employment rates of the elderly (men age 60 to 64) across countries



Source: OECD.Statistics <https://stats.oecd.org>

Figure 3: The employment rates of the elderly (men age above 65) across countries



Source: OECD.Statistics <https://stats.oecd.org>

Figure 4: The 2006 EESL and the 1994 pension revisions

Age Cohort born	60	61	62	63	64
Born before 1941.4.1	basic part of pension starts				
1941.4.2~ 1943.4.1		basic part of pension starts			
1943.4.2~ 1945.4.1			basic part of pension starts		
1945.4.2~ 1947.4.1				basic part of pension starts	
1947.4.2~ 1949.4.1					basic part of pension starts
1949.4.2~ 1953.4.1					

Figure 5: Sample consist of cohorts and questionnaire waves

Survey Year	2000	2001	2002	2003	2005	2006	2008	2010	2012	
Survey Month	10-11	10-11	10-11	10-11	8-11	10-12	10-12	2-4	2-4	
control group	1941.4-	59	60	61	62					
	1942.4-	58	59	60	61					
	1943.4-		58	59	60	62				
	1944.4-			58	59	61	62			
treatment group	1946.4-					59	60	62		
	1947.4-					58	59	61	62	
	1948.4-						58	60	61	
	1949.4-							59	60	62
	1950.4-								58	59

Table 1: Summary Statistics

Variable	Obs.	Mean	Std. dev.	Min	Max
<i>Outcome Variables</i>					
Leisure Satisfaction	592	3.416	0.994	1	5
House-life Satisfaction	592	3.757	0.953	1	5
Family financial satisfaction	592	3.125	1.112	1	5
Happiness	592	3.882	0.929	1	5
<i>Treatment Variable</i>					
Employment	592	0.617	0.487	0	1
Regular employee	592	0.551	0.498	0	1
Non-regular employee	592	0.066	0.248	0	1
<i>Control Variable</i>					
Age	592	59.568	1.448	58	62
Cohort	592	1945.412	3.055	1941	1950
Age=60 or 62	592	0.419	0.494	0	1
Cohort=1	592	0.537	0.499	0	1
Mar	592	0.916	0.278	0	1
Unhealth	592	0.517	0.5	0	1
Large town	592	0.177	0.382	0	1
Equivalent income	441	428.948	281.74	0	2300

Note: Data Source: JGSS 2000,2001,2002,2003,2005,2006,2008,2010,2012 waves.

Table 2: Effect of employment on Subjective well-being: POLS estimates.

	Leisure Satisfaction (1)	House-life Satisfaction (2)	Family financial satisfaction (3)	Happiness (4)
Employment	0.000 (0.081)	-0.036 (0.076)	0.137* (0.079)	0.050 (0.076)
Age	-2.884 (2.716)	-1.072 (2.586)	-0.023 (2.760)	-0.926 (2.571)
Age2	0.024 (0.023)	0.009 (0.022)	0.001 (0.023)	0.008 (0.021)
Mar	0.260* (0.148)	0.747*** (0.160)	0.384*** (0.134)	0.831*** (0.150)
Unhealth	-0.420*** (0.076)	-0.452*** (0.073)	-0.454*** (0.076)	-0.475*** (0.073)
Large town	0.021 (0.104)	0.127 (0.100)	0.131 (0.102)	0.108 (0.097)
Year dummy	Yes	Yes	Yes	Yes
Constant	85.724 (81.408)	30.997 (77.590)	-0.798 (82.739)	27.870 (77.037)
Observations	592	592	592	592
R-squared	0.086	0.157	0.126	0.157

Notes: * significant at 10%; ** significant at 5%; *** significant at 1%. Standard errors in parentheses.

Table 3: Effect of 2006EESL and pension revisions(first stage)

Stage1(Reg)	Employment
Age=60 or 62	-0.307*** (0.059)
Cohort	0.058 (0.051)
Cohort*Age	0.196** (0.079)
Mar	0.105 (0.070)
Unhealth	-0.023 (0.039)
Large town	0.037 (0.051)
Constant	0.575*** (0.079)
Observations	592
R-squared	0.069
F	13.6692
Prob > F	0.0000

Notes: * significant at 10%; ** significant at 5%; *** significant at 1%. Standard errors in parentheses.

Table 4: Effect of employment on Subjective well-being: IV-POLS estimates.

	Leisure Satisfaction (1)	House-life Satisfaction (2)	Family financial satisfaction (3)	Happiness (4)
Employment	-0.470 (0.816)	-1.114 (0.869)	-0.863 (0.881)	-0.760 (0.833)
Age=60 or 62	-0.040 (0.178)	-0.183 (0.190)	-0.102 (0.195)	-0.220 (0.175)
Cohort	0.206 (0.136)	0.410*** (0.149)	0.294** (0.149)	0.297** (0.135)
Mar	0.291* (0.169)	0.847*** (0.191)	0.474*** (0.176)	0.919*** (0.177)
Unhealth	-0.429*** (0.081)	-0.474*** (0.087)	-0.505*** (0.088)	-0.489*** (0.081)
Large town	0.065 (0.108)	0.205* (0.117)	0.186 (0.119)	0.166 (0.109)
Constant	0.140 (0.480)	-0.024 (0.519)	0.210 (0.510)	-0.217 (0.490)
Observations	592	592	592	592

Notes: * significant at 10%; ** significant at 5%; *** significant at 1%. Standard errors in parentheses.

Table 5: Effect of 2006EESL and pension revisions: Stage I (Mlogit)

Stage I (Mlogit)	Regular employee	Non-regular employee 3
Age=60 or 62	-1.440*** (0.275)	0.198 (0.613)
Cohort	0.295 (0.238)	-0.307 (0.757)
Cohort*Age	0.642* (0.372)	1.716* (0.889)
Mar	0.445 (0.318)	0.550 (0.656)
Unhealth	-0.121 (0.181)	0.003 (0.357)
Large town	0.187 (0.240)	0.053 (0.466)
Constant	0.269 (0.358)	-2.965*** (0.811)
Observations	592	592

Notes: * significant at 10%; ** significant at 5%; *** significant at 1%. Standard errors in parentheses.

Table 6: Effect of employment status on Subjective well-being:
Two-stage procedure POLS estimates.

	Leisure Satisfaction (1)	House-life Satisfaction (2)	Family financial satisfaction (3)	Happiness (4)
Regular employee	-0.012 (0.083)	-0.014 (0.079)	0.172** (0.082)	0.112 (0.076)
Non-regular employee	0.054 (0.151)	-0.276* (0.149)	-0.204 (0.142)	-0.361** (0.145)
Age=60 or 62	5.772 (3.634)	8.448** (3.887)	5.883 (3.807)	7.114* (3.805)
Cohort	-1.108 (0.810)	-1.545* (0.862)	-1.066 (0.854)	-1.357 (0.844)
Mar	-0.418 (0.448)	-0.213 (0.464)	-0.265 (0.455)	0.019 (0.448)
Unhealth	-0.012 (0.276)	0.146 (0.295)	-0.074 (0.286)	0.038 (0.289)
Large town	-0.490 (0.370)	-0.622 (0.388)	-0.389 (0.372)	-0.536 (0.366)
mills2	1.734 (1.123)	2.523** (1.199)	1.715 (1.173)	2.153* (1.175)
mills3	-0.395 (0.243)	-0.585** (0.260)	-0.406 (0.255)	-0.490* (0.254)
Constant	-0.878 (0.613)	-1.891*** (0.623)	-1.331** (0.634)	-1.655*** (0.618)
Observations	592	592	592	592
R-squared	0.066	0.140	0.107	0.161

Notes: * significant at 10%; ** significant at 5%; *** significant at 1%. Standard errors in parentheses.

Table 7: Effect of employment status on Subjective well-being:
Two-stage procedure POLS estimates.(control for equivalent income)

	Leisure Satisfaction	House-life Satisfaction	Family financial satisfaction	Happiness
	(1)	(2)	(3)	(4)
Regular employee	0.021 (0.098)	-0.023 (0.094)	0.117 (0.093)	0.070 (0.089)
Non-regular employee	0.186 (0.168)	-0.204 (0.164)	-0.039 (0.155)	-0.199 (0.158)
Mar	-1.244** (0.511)	-0.541 (0.528)	-0.616 (0.459)	-0.556 (0.488)
Age=60 or 62	3.391*** (1.168)	3.176*** (1.189)	2.377** (1.058)	3.362*** (1.117)
Cohort	-0.639** (0.288)	-0.513* (0.279)	-0.393 (0.266)	-0.541** (0.265)
Unhealth	0.040 (0.188)	-0.041 (0.189)	-0.135 (0.163)	0.014 (0.175)
Large town	-0.861** (0.370)	-0.771** (0.362)	-0.550* (0.320)	-0.881*** (0.318)
mills2	1.717*** (0.606)	1.636*** (0.601)	1.200** (0.536)	1.729*** (0.557)
mills3	-0.051 (0.040)	-0.040 (0.039)	-0.021 (0.038)	-0.054 (0.038)
Equivalent income	0.000 (0.000)	0.000** (0.000)	0.001*** (0.000)	0.001*** (0.000)
Constant	3.818** (1.551)	3.100** (1.463)	2.155 (1.351)	2.940** (1.349)
Observations	441	441	441	441
R-squared	0.080	0.169	0.220	0.221

Notes: * significant at 10%; ** significant at 5%; *** significant at 1%. Standard errors in parentheses.

Appendix

Table 8: Test for exogeneity of IV

	Leisure Satisfaction	House-life Satisfaction	Family financial satisfaction	Happiness
	(1)	(2)	(3)	(4)
Age=60 or 62	0.104 (0.118)	0.158 (0.113)	0.163 (0.116)	0.013 (0.116)
Cohort	0.178* (0.099)	0.346*** (0.096)	0.244** (0.098)	0.252*** (0.092)
Age*Cohort	-0.092 (0.157)	-0.218 (0.150)	-0.169 (0.156)	-0.149 (0.149)
Mar	0.241 (0.149)	0.730*** (0.160)	0.383*** (0.134)	0.839*** (0.150)
Unhealth	-0.418*** (0.076)	-0.448*** (0.073)	-0.485*** (0.076)	-0.471*** (0.071)
Large town	0.048 (0.102)	0.163 (0.099)	0.154 (0.101)	0.138 (0.095)
Constant	-0.130 (0.164)	-0.664*** (0.174)	-0.286* (0.152)	-0.654*** (0.165)
Observations	592	592	592	592

Notes: * significant at 10%; ** significant at 5%; *** significant at 1%. Standard errors in parentheses.