WELL-BEING OF OLDER PEOPLE IN EAST ASIA

THE PEOPLE'S REPUBLIC OF CHINA, JAPAN, AND THE REPUBLIC OF KOREA

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ABSTRACT

East Asia is undergoing a rapid demographic transition and "super" aging. As a result of steadily decreasing fertility and increasing life expectancy, older people's proportion of the population and the old-age dependency ratio is rising across all countries in East Asia, particularly in the People's Republic of China (PRC), Japan, and the Republic of Korea (ROK). In this paper, we empirically investigate the well-being of older people in these three countries, using comparable microlevel data from the China Health and Retirement Longitudinal Study (CHARLS), the Japanese Study of Aging and Retirement (JSTAR), and the Korean Longitudinal Study on Aging (KLoSA). Specifically, we examine the depressive symptom scale as a measure of well-being and estimate the impact of four broad categories—demographic, economic, family-social, and health. The decomposition and simulation analysis reveals that although much of the difference in mean depression rates among countries can be explained by differences in the characteristics of older people in the three countries, there remain significant differences across countries that cannot be explained. In particular, even after accounting for a multitude of factors, older people in the ROK are more likely to be depressed than in the PRC or Japan.

Keywords: aging, well-being, depression, suicide, panel data

JEL codes: D1, I3, J14

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I. Introduction

East Asia is undergoing a rapid demographic transition and "super" aging. As a result of steadily decreasing fertility and increasing life expectancy, older people's proportion of the population and the old-age dependency ratio is rising across all countries in East Asia, particularly in the People's Republic of China (PRC), Japan, and the Republic of Korea (ROK) (Figures 1 to 4). While these three countries are vastly different in size, stage, and speed of economic development (Figure 5), their demographic trends are quite comparable. They also share a strong cultural heritage of filial piety, a heritage that has become strained by emerging individualism and the separation of children's workplaces from their parents' residences. Although a three-generational household (including three generations living in proximity) or the co-residence of adult children with older parents has been considered the ideal realization of filial piety, the rate of co-residence between adult children and older parents has continued to decrease. Yet, public pension schemes are not sufficiently mature to provide old-age income support in emerging countries like the PRC and the ROK, raising the question of whether older people will receive sufficient support with the fading value of filial piety.

Despite incredible economic growth, several indicators, such as happiness and suicide rates, suggest that the well-being of older people in three countries is not necessarily sound. The PRC ranked 93rd in the 2013 World Happiness Report, Japan ranked 43rd and the ROK placed 41st happiest among 156 countries. While the 2023 World Happiness Report shows that the rankings of the ROK and Japan remain comparable at 57th and 47th, respectively, the PRC's ranking has improved to 64th among 137 countries. The ROK has the highest suicide rate among the Organisation for Economic Co-operation and Development (OECD) countries, at 32 per 100,000 persons, followed by Japan, at 21.7, which is far above the rate in the United States (US) at 12.3 (OECD 2015). In Figure 6, we report suicide rates, which are plausible indicators of ultimate ill-being, for the three countries over time, for both total population and older population (above age 60). It shows that suicide rates for older people (those above age 60) are higher than for the total population in all three countries, with the gap between the two being greatest in the ROK, followed by the PRC and then Japan. During the 2000s, older people's suicide rates have been very high in the ROK (generally above 60 persons per 100,000 population) and somewhat lower (less than 30 suicides per 100,000 population) in the PRC and Japan. Trends over time differ across countries. In the ROK, older people's suicide rates increased significantly in the 2000s compared to the 1990s. Japan had a spike in suicide rates right after the financial crisis in the late 1990s and has been declining gradually over time (Sawada, Ueda, and Matsubayashi

2017). The PRC also saw a slight fall in older people's suicide rate in the early 2000s. One distinctive feature of the PRC is that suicide rates are much higher in the rural population compared to the urban population (Figure 7). Among older people, the rural suicide rate is nearly 30 suicides per 100,000 population compared to about 15 suicides per 100,000 population in urban areas. Despite these facts and rich existing studies on suicides, recent empirical studies document the lack of strong correlations between suicide and measured well-being especially at an aggregate level (Case and Deaton 2015, 2020; Chen et al. 2012).

In this paper, we empirically investigate the well-being of older people in the PRC, Japan, and the ROK, using comparable microlevel data from the China Health and Retirement Longitudinal Study (CHARLS), the Japanese Study of Aging and Retirement (JSTAR), and the Korean Longitudinal Study on Aging (KLoSA). These three surveys were designed to provide comparable data for cross-country analysis. Using harmonized data, we conduct parallel analysis to examine the well-being of older people and its correlates. Specifically, we examine the depressive symptom scale as a measure of well-being and estimate the impact of four broad categories—demographic, economic, family-social, and health.

II. Prior Literature

There has been rising interest in assessing subjective well-being to monitor societal progress and evaluate policy (Stiglitz, Sen, and Fitoussi 2009; De Neve et al. 2018). Subjective well-being has been found to vary by age and by country (Deaton 2008), suggesting that there are potentially modifiable environmental factors that impact subjective well-being. Taking advantage of internationally harmonized longitudinal data on subjective well-being, we investigate what may contribute to variations in subjective well-being by age and by country.

Economists and psychologists do not agree on how subjective well-being (SWB) varies by age. Deaton (2007) offered an economic framework to explain this relationship. By referring to SWB as instantaneous utility (instead of permanent utility), SWB can vary with age. Specifically, he posited that SWB would have "an inverse U-shape, rising at first as people accumulate human capital, self-knowledge and the ability to enjoy themselves—earn to be happy—and then eventually falling as the capacity to enjoy fails with age" for health or economic reasons.

Most psychologists, on the other hand, do not support this premise, and the socio-emotional selectivity theory argues that SWB increases with age through successful adaptation (Diener et al. 1999, Hendrie et al. 2006). Carstensen (1995) explains this positive relationship as

follows: as people move into their final years of life, they become increasingly conscious of the amount of time they have left to live, and this awareness of impending mortality may lead older people to focus on ways to make their remaining experiences as enjoyable as possible.

It is interesting to note that most of the recent empirical economic literature concluded a U-shape relationship between age and SWB (Frijters and Beatton 2012 and Blanchflower 2021 review this). This conclusion is drawn from significant age and age-squared coefficients in regression models after controlling for covariates, such as health and economic conditions. The age–SWB relationship is of interest, both with and without controlling for covariates. From a policy perspective, it is important to know how the SWB of young or old persons compares, on average, with those at midlife. It is also important to understand how other factors affect SWB in addition to age. This will yield insight into determinants of successful aging and under what conditions SWB can increase with age.

A major part of the literature on cross-country variations in SWB has been inspired by Easterlin (1974). In that work, he did not find a link between the income level of society and the average level of SWB. Within a country, however, he finds that one's SWB depends on one's relative position in the income distribution. Recently, contrary evidence has been provided by Deaton (2008), who documents that if one considers a much wider range of countries arrayed by their level of economic development, the positive association between income and SWB reappears. Similar results have also been found by Di Tella, MacCulloch, and Oswald (2003).

Cross-country variations in the age–SWB relationship have not received explicit research attention, although significant variations are expected given institutional variations influencing the well-being of older people, such as old-age pension provisions and health insurance. Although cross-country comparison was not the explicit goal, there have been a few studies that examined this relationship using data from two populations, Germany and the United Kingdom (UK) (e.g., Baird, Lucas, and Donnellan 2010, Wunder et al. 2009), while other researchers (Clark 2007, Gwozdz and Sousa-Poza 2010) used the same data to investigate the relationship, using different specifications.

In summary, the prior literature suggests that the age–SWB relationship may vary by country (Blanchflower 2021, Oshio and Shimizutani 2024). For the US, Easterlin (2006) observed an inverted-U-shaped relationship from age 18 to 89 after controlling for birth year dummies. For the UK, Clark (2007) found a U-shaped relationship from age 16 to 64 after controlling for birth year effects. Using the same data but examining a wider age span from age 16 to 91, Wunder et

al. (2009) and Baird, Lucas, and Donnellan (2010) found a second turning point later in life. For the PRC, Lei et al. (2015) found a U-shape relationship from age 16 to 76 with four models progressively controlling for basic demographic, health, economics and social network variables. In contrast, evidence drawn from the ROK generally reveals a negative relationship between age and measures of well-being (Oh et al. 2012). Intriguingly in Japan, both a U-shape relationship and a negative relationship between age and measured well-being depending on the data set and methodologies employed for the analysis (Oshio and Kobayashi 2011; Ohtake 2012; Tiefenbach and Kohlbacher 2013; Oshio and Shimizutani 2024). The mixed results in Japan may manifest itself the importance of controlling for unobserved heterogeneities by using microlevel panel data. Beyond age and income levels, the prior literature has identified a number of determinants of SWB, suggesting that poor health, unemployment, and lack of family and social contact are strongly negatively associated with SWB, although causality has not been well-established (Dolan, Peasgood, and White [2008] and Diener [2012] have the review of literature; Steptoe, Deaton, and Stone [2015] review the association between SWB and health, and Fonseca et al. [2014] review the association between SWB and work). More recent studies with data from the PRC also address the association between subjective well-being and various factors. For example, Lei et al. (2015) address the importance of social networks on happiness and life satisfaction, Lei et al. (2014) and Chen and Fang (2021) emphasize socioeconomic status and demographic gradients, respectively, in depression. In the ROK, recent studies based on the KLoSA and other nationally representative data have found that measures of older people well-being (e.g., depressive symptoms and life satisfaction) are associated with education (Lee and Smith 2011), number of children (Kim et al. 2015), co-residence with children (Do and Malhotra 2012), intergenerational financial transfers (Lee et al. 2014), and social network (Park et al. 2014). Data from Japan analyzed by Kuroki (2011) also shows the importance of social capital captured by trust in improving individual happiness in addition to other socioeconomic determinants of well-being such as education level, employment status, income, and assets (Ohtake, 2012). In contrast to the international literature, most of the studies using Japanese data find significant differences in the well-being of men and women (Tiefenbach and Kohlbacher 2013). We simultaneously examine the association between these key determinants and SWB in the PRC, Japan, and the ROK, and investigate the strength of their association in these three countries and whether such a relationship varies across countries.

III. Data

We use data from the 2011–2012 CHARLS, the 2011–2012 JSTAR, and the 2012 KLoSA. JSTAR was conducted by the Research Institute of Economy, Trade and Industry (RIETI), Hitotsubashi University, and the University of Tokyo. All three surveys are a large-scale, longitudinal survey of older population residing in the community, modeled after the Health and Retirement Study, and include detailed questions on income and assets, demographics, living arrangements, health, and labor force participation (Lee 2010).

The baseline wave of CHARLS was conducted from 2011 to 2012, interviewing older adults aged 45 or older and their spouses at all ages. A stratified multi-stage probability sample was drawn, first by stratifying urban districts and rural counties by per capita GDP, then selecting urban communities or rural villages proportionate to population size (PPS), and finally, randomly selecting households. CHARLS interviewed 17,708 respondents in 450 villages/urban communities in 150 counties/districts, covering 28 of the PRC's provinces, excluding Tibet.

The baseline KLoSA was collected from August to December 2006. A stratified multi-stage probability sample was drawn from the 2005 Census. The first stage of sampling consisted of census enumeration districts stratified by the geographic location and characteristics of the enumeration districts (i.e., rural/urban and housing type). In the second sampling stage, households were sampled within the sampled enumeration district. A total of 10,254 respondents completed the interview in the first wave. The follow-up, longitudinal waves of data were collected during the second half of 2008, 2010, and 2012. Of the original cohort of 10,254 respondents, 327 were known to have died since then, and no refresher sample was added. For the 2012 Wave, 7,486 respondents completed the interview, from which our analysis sample was drawn.

The baseline JSTAR sampled 5 municipalities in 2007, which have been surveyed every 2 years since then, an additional 2 municipalities in 2009, and an additional 3, bringing the total to 10 municipalities in 2011. Its respondents are persons aged 50 to 75 as randomly selected from the Basic Resident Register.[1] The first five municipalities include Adachi-Ku, Kanazawa City, Shirakawa City, Sendai City, and Takigawa City (N=4,163 in 2007 with 82% to 87% retention rate in the follow-up waves in 2009 and 2011). The two municipalities added in 2009 include Tosu City and Naha City (N=1567 in 2009 with a 70% retention rate), and the three municipalities added in 2011 include Chofu City, Tonbayashi City, and Hiroshima City (N=2,184). Our analysis sample is

[1] This sampling method differs from those of the HRS, the SHARE, and the ELSA. The JSTAR uses its sampling strategy so as to allow analysts to compare economic activities of individuals under the same socioeconomic environment such as labor market conditions.

drawn from the 2011 Wave (fieldwork extended to 2012) that included 10 municipalities, which were chosen to be diverse in size, urban/rural mix, and industries they support, enabling them to obtain a national representation by appropriately weighting the data with newly created weights based on published census data (Ichimura 2014).

We pool out the data from the 2011–2012 CHARLS and 2012 KLoSA as well as the 2011–2012 JSTAR. As the age of the JSTAR sample is restricted to 50 to 75 years at baseline, we chose the age span for our analysis sample as 54 to 78 years, where we employ age as a categorical variable with the following groups: 54–59 years (reference), 60–64, 65–71, and 72–78. The sample sizes for the analysis sample are: 9,720 respondents for CHARLS, 3,687 for JSTAR, and 5,614 for KLoSA (Table 1).

IV. Measures

Our well-being variable is a binary variable, indicating elevated depressive symptoms based on the Center for Epidemiologic Studies Depression (CESD). CESD is a self-report scale for depressive symptoms developed to identify high-risk individuals for epidemiological studies (Radloff 1977). All three surveys included a version of CESD, asking questions about depressive symptoms during the past week, using a four-point Likert scale (indicating the frequency of experiencing each symptom, ranging from none [0] to almost every day [3]). CHARLS and KLoSA included a 10-item version, while JSTAR included a 20-item version. After item-level comparisons, we identified 10 items from JSTAR that are comparable to CHARLS and KLoSA and created a CESD score ranging from 0 to 30 with higher scores representing more frequent depressive symptoms. The cut-off point, reflecting clinically significant levels, for the 10-item CESD score, has been suggested as a score of 10 or higher (Andreasen et al. 1994).

We include the following demographic variables: gender, education, marital status, number of children, and regional dummy variables. We use categorical variables of education: illiterate, primary school, middle school (reference), high school, and college or more. Significant cross-country variation is observed: as shown in Table 1, much higher educational attainment in Japan. We include a binary variable indicating currently married (not currently married as reference). For the number of children, we include a continuous variable of the number of children and a number of children square to capture potential non-linearity.

For economic variables, we include the following variables with all monetary variables converted to US dollars using purchasing power parities (PPPs) (World Bank 2011): (i) a binary variable of currently working; (ii) relative food consumption quartiles based on per capita consumption using equivalence scale of 0.5 for an additional adult and 0.3 for a child; (iii) a binary variable of whether receiving a pension; (iv) log of 1+pension income received by respondent and spouse during the past 12 months; (v) a binary variable, indicating whether expect to receive pension; (vi) a binary variable, indicating home ownership; (vii) log of 1+gross housing value, not subtracting mortgages; (viii) log of 1+total debt, including mortgages; and (ix) log of 1+total financial assets.

For family and social variables, we include (i) log of 1+amount of total financial transfer given to children during the past 12 months; (ii) log of 1+amount of financial transfer received from children in the past 12 months; (iii) a binary variable, indicating frequent (at least weekly) contact with children; (iv) a binary variable, indicating frequent (at least weekly) social activities; (v) a categorical variable of living arrangement: living alone, living with a partner only (reference), living with children (whether with spouse or not), and living with others (not including children); and (vi) a binary variable, indicating to live nearby children (including co-residing children).

For health variables, we include a binary variable of having any difficulties in activities of daily living (ADLs). CHARLS, JSTAR, and KLoSA have the following five items in common in capturing ADLs: dressing, bathing or showering, eating, getting in or out of bed, and using the toilet; and a set of binary variables, indicating doctor-diagnosed diseases, including hypertension, diabetes, cancer, lung disease, heart disease, stroke, and arthritis.

V. Methodology

Our baseline econometric specification is a country-specific linear probability model of the determinants of whether individual *i* in country *c* has elevated depressive symptoms (D_{ic}).

$$D_{ic} = X_{ic}'\beta_c + \varepsilon_{ic} \quad (1)$$

The covariates X_{ic} include four categories of variables: basic (B_{ic}), economic (E_{ic}), social (S_{ic}), and health (H_{ic}). We first estimate the model including only the basic variables (basic specification). We then add the economic variables only, the social variables only, and the health variables only (partial specifications). Finally, we include all of the variables together (full specification). These regressions enable us to compare which factors predict elevated depressive

symptoms in each country by examining similarities and differences in the coefficient estimates from each country regression (β_c).

Explaining differences in depression across countries. Using the estimation results for equation 1 using the full specification, we conduct two simple exercises to examine what explains the differences in depression likelihood in the three countries. First, we conduct an Oaxaca decomposition analysis of the differences in the predicted probability of depression for each pair of countries. Comparing the results for country 1 and country 2, we can write down the following expression for the pair-wise difference in predicted probabilities R, equal to the mean predicted probability of depression in country 1 minus the mean predicted probability of depression in country 2:

$$R = (X_{i1} - X_{i2})'\beta^* + [X_{i1}'(\beta_1 - \beta^*) + X_{i2}'(\beta^* - \beta_2)] \quad (2)$$

This decomposition formula explains the difference in depression as the sum of explained and unexplained components. The explained part of the difference is what can be explained by the characteristics of older people. The coefficients used to evaluate the effect of differences in covariates are the coefficients from a pooled regression using data from both countries (β^*). The unexplained part is from differences in the coefficients of the two country-specific regressions (β_1 and β_2). These explained and unexplained parts can be divided among the four categories of variables (B, E, S, H) or among individual covariates. From these results, we can learn how much of the difference in depression prevalence in the PRC and Japan (or the ROK and Japan, or the PRC and the ROK) is due to differences in the characteristics of older people and due to differences in how these characteristics influence the likelihood of depression.

We can also conduct a counterfactual simulation exercise in which we use the country-specific regression coefficients from estimating equation (1) to investigate how much expected depression rates would change if the distribution of covariates were the same as in another country. For example, what would the depression rate be in the PRC if older Chinese had the same distribution of characteristics as older Japanese? We can use the three sets of country-specific coefficients and three sets of country-specific distributions of covariates to calculate nine expected depression rates.

Common support and matching analysis. The linear regression analysis is sensitive to the support and the distribution of regressors. To address this issue, we apply the program evaluation method that assumes selection on observables. Using this approach, we examine the effect of each of the variables controlling for other variables.

We would assume change if the distribution of covariates were the same as in another country. For example, what would the depression rate be in the PRC if older Chinese had the same distribution of characteristics as older Japanese? We can use the three sets of country-specific coefficients and three sets of country-specific distributions of covariates to calculate nine expected depression rates.

Specifically, we assume, for $c = C, J, K$,

$$E(Y_c|D = c, X) = E(Y_c|X)\,.$$

Let $Pr\{D = c|X\} = P_c(X)$. Under this assumption, Imbens (2000) showed that if $P_c(X) > 0$, for $c = C, J, K$,

$$E(Y_c|D = c, P_c(X)) = E(Y_c|P_c(X)).$$

Thus, integrating over $P_c(X)$, we can identify $E(Y_c)$.

The same argument can be made, conditioning on a subvector of $X = (X_1, X_2)$, X_1. Thus, under the same assumption with Imbens (2000), we can show that

$$E(Y_c|D = c, X_1, P_c(X)) = E(Y_c|X_1, P_c(X)).$$

Integrating the right-hand side over $P_c(X)$ given X_1, we obtain $E(Y_c|X_1)$.

Our sampling is carried out for each country. Thus, sampling is not i.i.d. over three countries. In this sense, we should analyze the data as if the sampling is choice-based. For the binary treatment case, Heckman and Todd (2009) showed that one can condition on the choice probability ratio obtained under choice-based sampling as if it is the propensity score. In the multinomial treatment case, the result does not generalize, so we obtain the propensity score from the choice probabilities obtained under choice-based sampling. In the tri-variate choice case, for each $c = C, J, K$, denoting the choice probability of country c obtained under choice-based sampling as $Q_c(X)$ and the unconditional choice probability ratio obtained under random sampling over choice-based sampling as R_c, we have

$$P_c(X) = \frac{Q_c(X)R_c}{Q_C(X)R_C + Q_J(X)R_J + Q_K(X)R_K}.$$

In implementation, we estimate the choice probability under choice-based sampling by Logit, as if sampling is i.i.d. and compute the right-hand side.

VI. Findings

We first present the sample characteristics in each country (Table 1). The sample size is the largest in the PRC (N=9,720), 70% larger than in the ROK (N=5,614) and more than twice the sample in Japan (N=3,687). The sample from Japan includes more women and are older than the samples from the PRC and the ROK. The most striking difference is found in education: almost half of the sample (47.8) in the PRC have no schooling, and 1 in 10 older adults in the ROK had no schooling compared to no such group in Japan. Only 11.9% of the sample from the PRC have high school or greater education compared to 64.3% in Japan and 42.4% in the ROK. The proportion of those who are married is much lower in Japan (55.6%) than those in the ROK (82.9%) and the PRC (84.7%). The average number of children is similar in the PRC (2.7) and the ROK (2.8) and higher than in Japan (2.14), and the proportion of the childless is much higher in Japan (10.3%) than the PRC (2.8%) and the ROK (2.5%).

Labor force participation is quite similar in all three countries: about 46.0% to 47.8% of older adults are working. Per capita food consumption in PPP is much lower in the PRC, showing differences in economic development. Japan and the ROK show about comparable food consumption in the median, while the distribution is more widely spread in Japan than in the ROK. Reflecting different stages of maturity in pension schemes, 92.6% of Japanese expect to receive a pension compared to 53.7% in the PRC and 59.1% in the ROK, and among those who currently receive a pension, pension income is much higher in Japan than the PRC and the ROK. It is interesting to note that the median pension income in the ROK is lower than in the PRC and one-quarter of the Japanese median pension income. Home ownership is the highest in the ROK (81.3%) followed by the PRC (75.7%) and Japan (63.1%), and the value of homes is similar in Japan and the ROK, which is much higher than in the PRC. Debt burden is higher in Japan and the ROK than in the PRC. About 20% to 28% of older adults in the ROK and Japan hold debts, compared to only 6.5% of older adults in the PRC, and the total amounts of debts are also much larger in Japan and the ROK. Financial asset ownership, on the other hand, is lower in the ROK (59.8%) than in the PRC and Japan, while the amount of total financial assets among those with any financial assets shows significant differences across countries, with the largest in Japan followed by the ROK and the PRC.

Financial transfers to non-resident children vary greatly across the country. Less than 1% of Japanese give financial transfers to non-resident children, while 19.4% of parents in the PRC and 4.7% of parents in the ROK give financial transfers. Financial transfers from children are also rare in Japan, while 38.5% of parents in the PRC and 36.8% of parents in the ROK receive

transfers from children. The amount of transfer is much larger in Japan and the ROK than in the PRC. More interactions with children are observed in the PRC, in terms of frequency of contacts, living close-by, and co-residence than those in Japan and the ROK. The proportion of living alone is the highest in Japan (20.0%), followed by the ROK (12.1%) and the PRC (7.1%). On the other hand, older adults in the PRC are less socially engaged than older adults in Japan and the ROK. About half of the sample from the PRC engage in social activities at least once a week compared to about 63% to 64% of older adults from the ROK and Japan.

Regarding health status, more older adults from the PRC report difficulty with activities of daily living (16.0%) than older adults from the ROK (2.4%) and Japan (4.6%). The prevalence of hypertension is the highest in Japan (35.6%), about 5 to 6 percentage points higher than those in the PRC and the ROK. The diabetes prevalence rate is similar in the ROK and Japan (about 13%), 6 percentage points higher than in the PRC. Cancer prevalence is the highest in Japan (4.7%), followed by the ROK (3.4%) and the PRC (0.9%). Lung disease is five times more prevalent in the PRC (11.3%) than in the ROK and Japan (2.1%). Heart disease is also most prevalent in the PRC (14.3%) followed by Japan (12.0%) and the ROK (5.5%), while the stroke prevalence rate is similar in all three countries at 3% to 4%. The arthritis prevalence rate is the highest in the PRC (34.6%), which is more than twice the rate in the ROK (15.2%) and almost five times the rate in Japan (7.2%). The proportion of depressive symptoms is the highest in the PRC (36.7%) followed by the ROK (26.5%) and Japan (15.5%).

We then examine the bivariate relationship between clinical depression and various covariates. Table 2 presents the mean percent of depressive symptoms by sex and other characteristics. In all three countries, a greater proportion of women show depressive symptoms than men, and the gender difference is the largest in the PRC: 44% of Chinese women show depressive symptoms, while 29.4% of Chinese men are depressed. In the ROK, a difference of seven percentage points is observed (29.8% women versus 22.9% men), and in Japan, the gender difference is only two percentage points (16.4% women versus 14.3% men).

Significant cross-country differences are also noted in the association between age and depression. In the PRC, an inverted U-shape is observed with the 60 to 71 age group being the most depressed. On the other hand, age is positively associated with being depressed in the ROK, while it is negatively associated in Japan from the mid-50s to mid-60s but then slightly positively associated after this and the association flattens after the 70s.

A strong education gradient in depression is found in the PRC and the ROK, while it is much more subtle in Japan. Marriage shows a protective effect against depression; such an effect is stronger in the PRC and the ROK than in Japan. Being childless is positively associated with depression in the PRC and the ROK, but it is not significantly associated with depression in Japan. Non-linearity (close to a U-shape) in the relationship between the number of children and depression is observed in all countries.

Work status is closely associated with depression in all three countries, but it matters most in the ROK, with the proportion of depressive symptoms people being twice as many among non-workers (34.6%) than workers (17.3%). This difference is much smaller in the PRC and Japan, showing only about four percentage point differences. Pension eligibility also matters in all three countries. On the other hand, home ownership is not associated with depression in the PRC, while it matters in Japan and the ROK.

Those who give transfers to children are less likely to be depressed than those who do not give in the PRC and the ROK, while the opposite is true in Japan. Similarly, those who receive transfers from children are more likely to be depressed than those who do not receive transfers in the PRC and the ROK, while the opposite is true in Japan. Those who are in frequent contact with children are less likely to be depressed in all three countries. The relationship between being depressed and having a child living nearby shows different associations across three countries, but the differences are small. Those who are living alone are more likely to be depressed than those who are living with someone else in all three countries, and such an effect is the strongest in the ROK. Frequent social activities are negatively associated with being depressed in all three countries.

Finally, having difficulty with activities of daily living and chronic diseases are positively associated with being depressed in all three countries, but this association is more modest in Japan than in the PRC and the ROK. Particularly, hypertension, diabetes, and lung disease are not significantly associated with being depressed in Japan. ADL difficulty has the most robust association with depression.

Tables 3 and 4 present the results from the linear probability models of having elevated depressive symptoms in the three countries. To facilitate cross-country comparisons, we first present the results from the full model with the F-statistics, testing cross-country differences in coefficients of a set of covariates (Table 3). We use the ROK as the base and test whether the relevant coefficients for the PRC and Japan are different from those for the ROK. We then further

examine what accounts for the association between the key demographic characteristics and depression, such as age gradients, by presenting the results from the base models together with the models controlling for each set of covariates (Table 4).

Cross-country difference is found in the coefficients of basic demographic characteristics, particularly sex, age, and education (Table 3). While bivariate results support that women are more depressed than men in all three countries, once we control for other demographic characteristics, only in the PRC do we see about a 9% higher probability of being depressed among women. We find very small age gradients in the PRC and the ROK (only in the mid- to late 70s for the ROK do we see some age gradient), but in Japan, the 54 to 59 age group is the most depressed, and age reduces the probability of being depressed. Once controlling for health covariates, most of the age gradient in the PRC is accounted for, while economic covariates account for most of the age gradient in the ROK (Table 4). In contrast, the probability of being depressed decreases as one ages in Japan, and such a negative age gradient is even more pronounced once all covariates are controlled. The finding that only Japan showed an age gradient for depression may be consistent with the “well-being paradox,” where subjective well-being can improve in later life despite worsening health conditions (Oshio and Shimizutani 2024). The education gradients in depression are found in all three countries. In all three countries, the lowest education group has around 10% higher probability of being depressed.

On the other hand, marital status and number of children do not show any significant cross-country differences. Married people are about 2.9 to 9.5 percentage points less likely to be depressed in all three countries, but once controlling for all covariates, being married is no longer significantly associated with depression in the ROK and Japan. The number of children has a non-linear relationship with the probability of being depressed only in the ROK, but once controlling for economic and social covariates, it is no longer significant in the full model.

The coefficients for economic covariates also differ across the three countries. Particularly, labor force participation is significantly associated with the probability of being depressed, and the coefficient is much larger in the ROK than those in the PRC and Japan (Table 3). In the ROK, workers are 10.3% less likely to be depressed than non-workers, which is three times stronger than in the PRC. Although almost all economic variables show a statistically significant association with the probability of being depressed only in the PRC, the coefficients are not statistically significant from those in the ROK and Japan. This may reflect that the PRC's relatively low economic development stage makes economic conditions critical for overall well-being.

How social variables are associated with the probability of being depressed varies across countries, except for transfers from and to children variables, although transfers from and to children are found to be significant only in the PRC. Frequent contact with children is statistically significant in all three countries without controlling for economic and health covariates (results not shown), but in the full model, it remains significant only in the PRC. Frequent social activities matter more in the ROK than in the other two countries: in the ROK, those who engage in social activities at least once a week are 9% less likely to be depressed than those who do not engage in frequent social activities in the ROK, while frequent social activities lower the probability of being depressed by four percentage points in the PRC and seven percentage points in Japan. The living arrangement also matters more in the ROK. Those who are living alone are 40.7% more likely to be depressed than those who are living with a partner in the ROK, while living arrangements are not significantly associated with the probability of being depressed in the PRC and Japan.

In all three countries, we find that poor health is strongly associated with the probability of being depressed, but health coefficients also differ across countries. Among the health covariates, ADL difficulties elevate the probability of being depressed the most. In the ROK, those with ADL difficulties are 30% more likely to be depressed than those without ADL difficulties, and ADL difficulties increase the probability by 21% in the PRC and 17% in Japan. Among disease variables, some cross-country differences are noted in hypertension, stroke, and arthritis coefficients. Specifically, hypertension is significantly associated with the probability of being depressed only in Japan, while stroke increases the probability of being depressed only in the PRC. Arthritis increases the probability of being depressed in the PRC and Japan, but not in the ROK.

In Table 5, we present the results of the Oaxaca decomposition analysis, which decomposes how much of the difference in predicted depression levels between pairs of countries is associated with differences in the distribution of covariates (explained), and with differences in coefficients, including country constants (unexplained). The predicted elevated depression levels are 0.28 for the PRC, 0.231 for the ROK, and 0.144 for Japan. It turns out that a large share of these differences can be explained by differences in the covariates across countries: 0.116 of the 0.140 difference (or 83%) between the PRC and Japan, 0.049 of the 0.087 difference (or 56%) between the ROK and Japan, and –0.107 of the –0.053 (or 202%) difference between the ROK and the PRC. In contrast, unexplained differences are small (0.024) and insignificant for the PRC–Japan comparison, and smaller in magnitude (but significant) for the ROK–Japan comparison

(0.038) and the ROK–PRC comparison (0.054). The fact that the unexplained differences between the ROK–Japan and the ROK–PRC are positive and significant suggests that something in the environment in the ROK is less protective of older people against depression than in the other two countries.

The bottom two panels of Table 5 decompose the explained and unexplained differences into the four categories of variables used in the regressions: basic, economic, social, and health. Among the explained differences, we find that the economic variables are most salient for explaining differences between the PRC and Japan and between the ROK and Japan, and health is most important for explaining the explained difference between the ROK and the PRC (and economic variables second and nearly equal in importance). Health is also an important part of the explained difference between the PRC and Japan; thus, the poor health of older Chinese helps explain the gaps between Japan and the ROK. Interestingly, the better health of Koreans than the Japanese actually helps narrow the explained depression gap between the two countries.

None of the components of the unexplained gaps in depression rates are statistically significant. However, it is notable that the large positive constant terms for the ROK–Japan and the ROK–PRC comparisons suggest that there remains a large unexplained country factor in the ROK that increases depression prevalence compared to the other two countries. Also, the comparisons with Japan suggest that differences in economic coefficients actually help reduce the depression gaps with both the PRC and the ROK (large and negative differences but not significant); this is likely due to how economic coefficients in Japan are generally small and statistically insignificant.

Three potential factors could play a crucial role in elucidating the largely unexplained portion of our analysis. First, the characteristics of wealth distribution, specifically income inequality and relative poverty status, which denote relative deprivation, may impact subjective well-being. Second, the age-friendliness of the environment, including the quality of roads, public transportation, and other local physical infrastructures, as well as the accessibility of quality public health services, could influence subjective well-being. Third, the preferences and subjective values of individuals, which may undergo significant shifts due to economic development and the progression of population aging, also have the potential to affect subjective well-being.

Next, we report the result of simulations in which we compare mean predicted probabilities of depression when we apply coefficients from each country-specific regression to the covariates of the other countries (Table 6). Thus, we ask the question: what would the predicted depression

be in the PRC using the coefficients from the ROK? Not surprisingly, given the Oaxaca decomposition results, we find that if all countries had the ROK coefficients, mean depression prevalence would increase in the PRC from 0.300 to 0.360 and in Japan from 0.147 to 0.272. If all countries had the PRC coefficients, the mean predicted depression probability would fall from 0.235 to 0.195 in the ROK and increase slightly from 0.147 to 0.160 in Japan. Interestingly, although Japan has the lowest depression rate using its own coefficients, if the PRC and the ROK had the Japanese coefficients, the mean predicted depression probability would increase substantially, from 0.300 to 0.429 for the PRC and from 0.235 to 0.307 in the ROK. This latter result suggests that there are factors rare in Japan but more common in the PRC and the ROK that increase depression much more in Japan than in the other two countries.

The regression results are sensitive to the differences in the distribution of the regressors when the model is misspecified. To partially address this issue, we reexamine the effect of each of the regressors using the matching framework. The results are presented in Table 7.

The average effects of a few variables differ significantly compared to those of the linear regression analysis. These are the effects of being in different consumption quartiles, having cancer, and having heart disease. All these variables' impacts are measured to be much larger negative effects with matching for the PRC and the ROK compared to that in Japan. The linear regression analysis indicates that being in the lowest quartile in the PRC or the ROK relative to Japan does not significantly raise the probability of being depressed, but the matching analysis indicates that it raises the probability by about 16% to 17% in both cases. The linear regression analysis indicates that having cancer in the PRC or the ROK relative to Japan does not significantly raise the probability of being depressed, but the matching analysis indicates that it raises the probability by about 30% in both cases. Furthermore, the linear regression analysis indicates that having heart disease in the PRC or the ROK relative to Japan does raise the probability of being depressed by about 10% in all three countries, but the matching analysis indicates that it raises the probability by about 20% more in the PRC and 14% more in the ROK than in Japan.

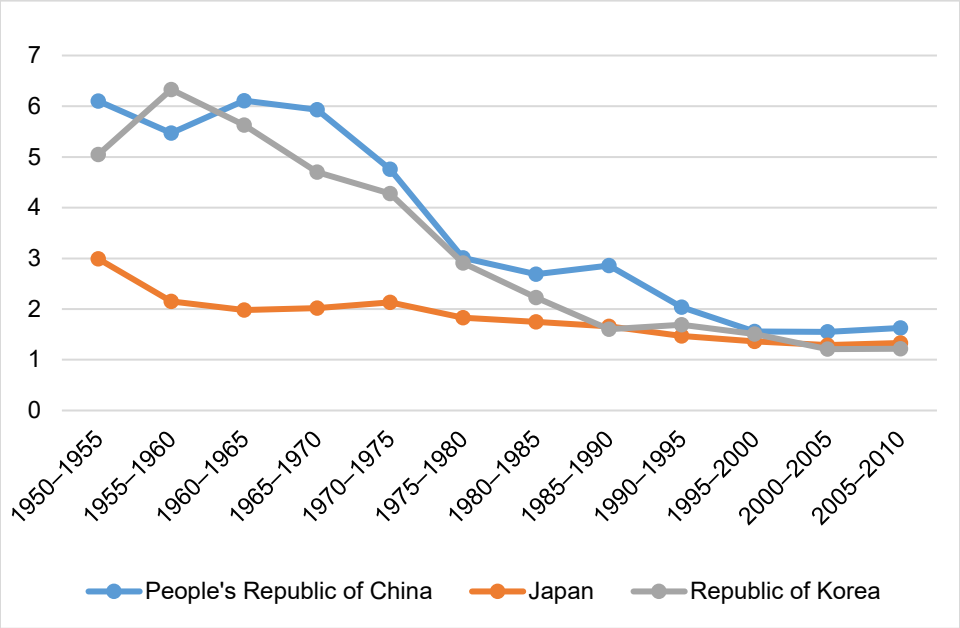
VII. Conclusion

We have conducted a comparative analysis of the determinants of elevated depressive symptoms in the PRC, Japan, and the ROK and using harmonized data from high-quality, multidimensional micro-datasets from the three countries. The results provide a rich characterization of similarities and differences in the determinants of the likelihood of older people's depression in the three societies. While certain factors emerge as very important in all three countries, such as education, labor force participation, contact with children, social interaction, and health; there also are differences in the magnitude of these effects, and the importance of factors such as age, marriage, and wealth. Surprisingly, access to pensions does not appear to be a key factor, except in the PRC, where economic conditions play an important role in well-being.

The decomposition and simulation analysis reveals that although much of the difference in mean depression rates among countries can be explained by differences in the characteristics of older people in the three countries, there remain significant differences across countries that cannot be explained. In particular, even after accounting for a multitude of factors, older people in the ROK are more likely to be depressed than in the PRC or Japan. We also explored the comparability of marginal effects when the distribution of covariates differs so much across countries by estimating a matching estimator and found evidence that the effects of some covariates change when we focus on characteristics that have common support across the three countries. Further exploration of the robustness of our findings to such specifications should be pursued.

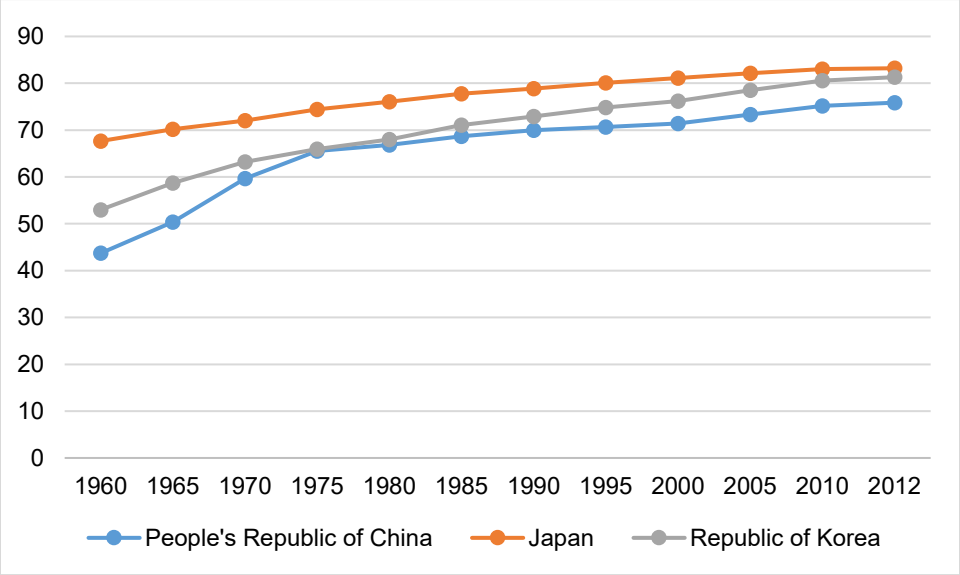
FIGURES AND TABLES

Figure 1: Total Fertility (Number of Children per Woman), 1950–2010



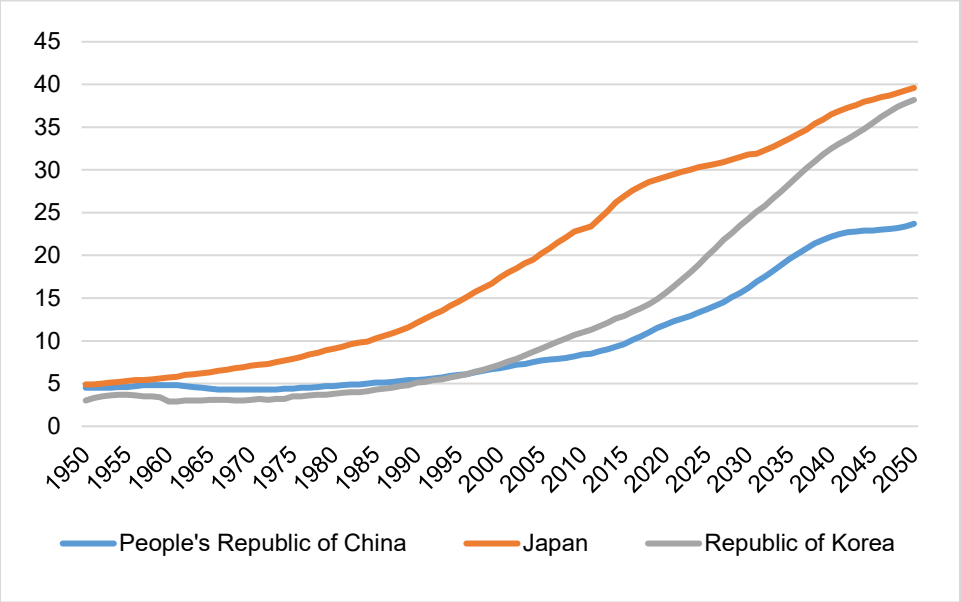
Source: United Nations (2013).

Figure 2: Life Expectancy at Birth, 1960–2012



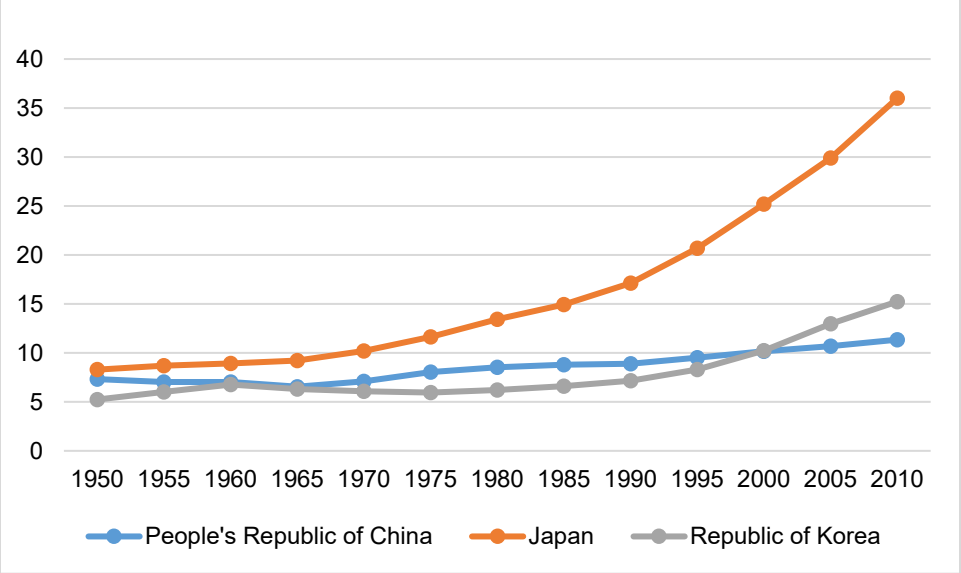
Source: World Bank (2015).

**Figure 3: Proportion of Older People (65+)
as a Proportion of Total Population, 1950–2050**



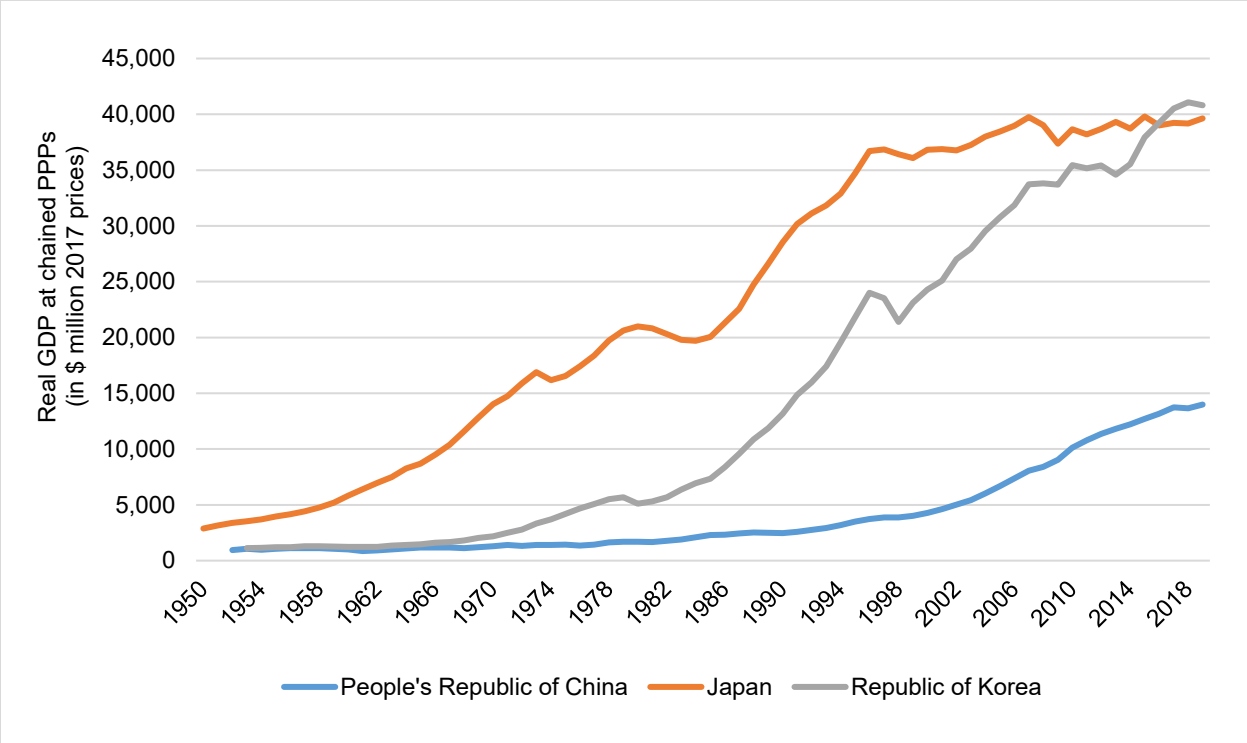
Source: OECD (2009).

**Figure 4: Old-Age Dependency Ratio
(Ratio of Population Aged 65+ per 100 Population 15–64), 1950–2010**



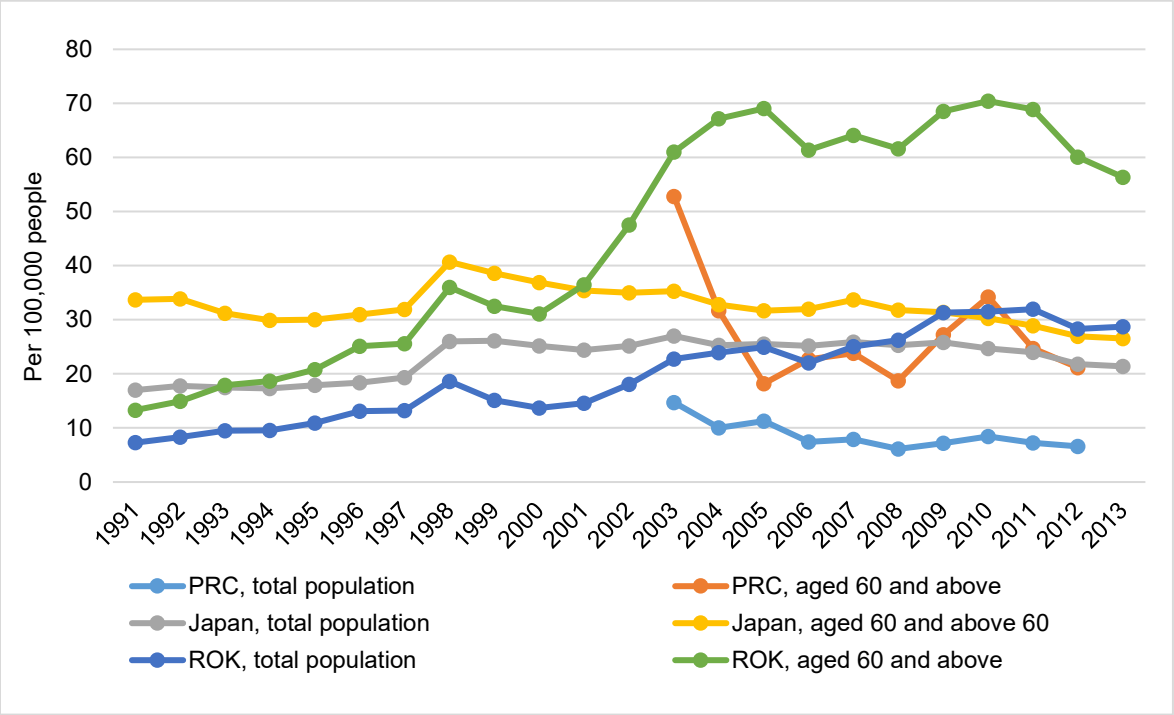
Source: United Nations (2013).

Figure 5: Per Capita Gross Domestic Product, 1950–2018



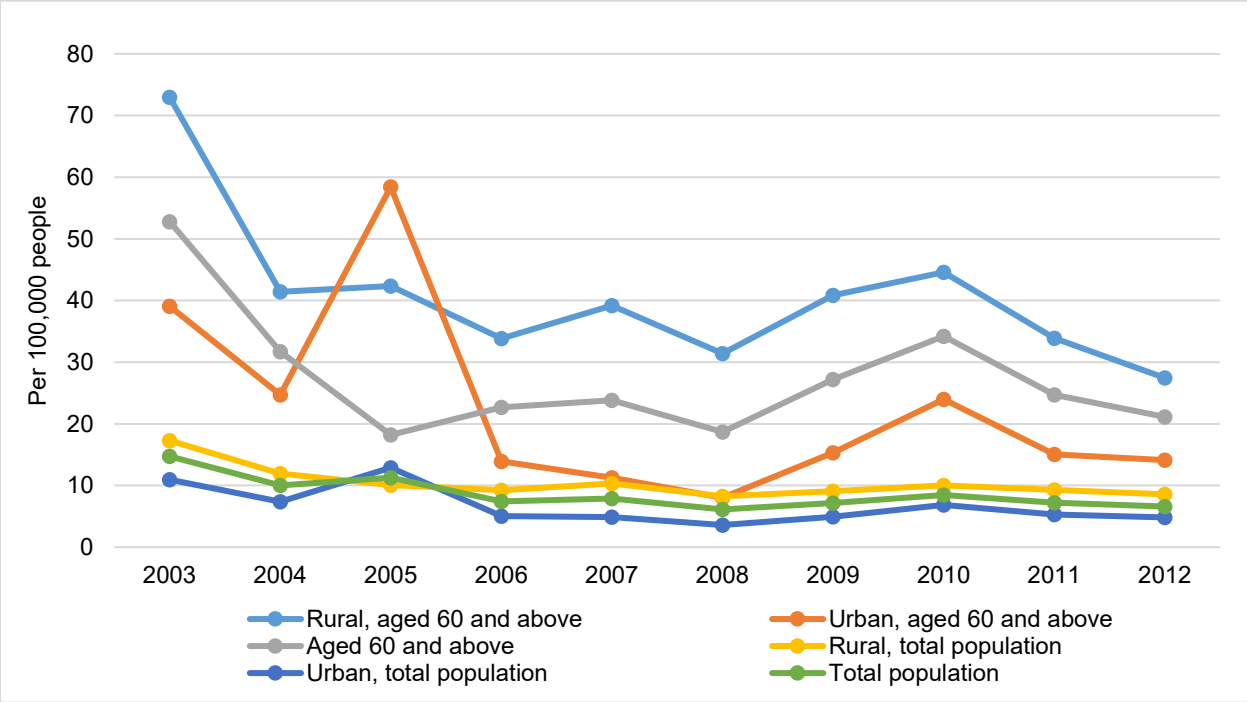
GDP = gross domestic product, PPP = power purchasing parity.
Source: Feenstra, Robert C., Robert Inklaar, and Marcel P. Timmer. 2015. "The Next Generation of the Penn World Table" *American Economic Review* 105 (10): 3150–82.

Figure 6: Suicide Rates, 1991–2013



PRC = People's Republic of China, ROK = Republic of Korea.
Sources: Cabinet Office data, National Police Agency suicide data, and Ministry of Internal Affairs and Communications, Population Census Data, and Population Estimates.

Figure 7: Suicide Rates in the People's Republic of China, 2003–2012



Source: China's Health Statistics Yearbooks.

Table 1: Summary Statistics: Analysis Sample at Age 54–78

	PRC	Japan	ROK
N	9,720	3,687	5,614
% Male	50.0	42	47.8
Age			
54 – 59	37.7	22.6	36.2
60 – 64	25.3	15.0	21.3
65 – 71	22.3	33.1	24.8
72 – 78	14.6	29.4	17.7
Education			
No school	47.8	0.0	9.7
Primary school	23.3	1.5	28.7
Middle school	17.0	34.2	19.2
High school	5.4	53.6	31.5
College+	6.5	10.7	10.9
% Married	84.7	55.6	82.9
No of children	2.8	2.14	2.7
% Childless	2.8	10.3	2.5
Economic			
% Working	47.8	46.0	46.7
HH Food consumption (PPP)			
10th	128	693	1,645
50th	938	3,257	3,431
90th	2,814	6,930	6,140
% Receive pension	38.2	75.9	37.0
Pension income (PPP)			
10th	211	5,024	1,447
50th	5,844	14,553	3,553
90th	16,234	32,051	20,394
% Expect to receive pension	53.7	92.6	59.1
% Own home	75.7	63.1	81.3
Gross housing value (PPP)			
10th	2,705	43,313	54,824
50th	22,998	155,925	164,471
90th	135,281	433,125	438,591
% With any debts	6.5	28.1	19.7
Total debts (PPP)			
10th	271	1,906	10,965
50th	4,058	25,988	38,377
90th	24,351	173,250	153,507

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	PRC	Japan	ROK
% With any financial assets	79.0	81.3	59.8
Total financial assets (PPP)			
10th	27	4,331	1,316
50th	271	51,975	16,447
90th	6,778	272,869	114,422
Family			
% Any transfer to non-resident children	19.4	0.6	4.7
% Any transfer from non-resident children	38.5	1.4	36.8
Total transfer to non-resident children (PPP)			
10th	27	2,080	219
50th	217	7,277	4,386
90th	4,329	15,593	32,894
Total transfer from non-resident children (PPP)			
10th	81	2,079	328
50th	541	4,158	1,316
90th	2,706	15,593	6,579
% Frequent contact with children	90.1	74.2	81.8
% Live nearby children	76.8	69.5	59.5
Living arrangement			
Living alone	7.1	20.0	12.1
Living with partner	34.9	27.0	40.3
Living with children (with or without partner)	53.4	43.9	42.2
Living with others	4.6	9.1	5.3
% Frequent social activities	49.5	63.4	63.8
Health			
% with any ADL difficulty	16.0	4.6	2.4
% With hypertension	29.2	35.6	28.4
% With diabetes	7.4	12.5	12.7
% With cancer	0.9	4.7	3.4
% With lung disease	11.3	2.1	2.1
% With heart disease	14.3	12	5.5
% With stroke	3.0	3.9	3.4
% With arthritis	34.6	7.2	15.2
% Depressive symptoms (CESD 10+)	36.7	15.5	26.5

ADL = activities of daily living, PPP = purchasing power parity, PRC = People's Republic of China, ROK = Republic of Korea.

Sources: 2011–2012 China Health and Retirement Longitudinal Study, 2012 Korean Longitudinal Study on Aging, and 2011–2012 Japanese Study of Aging and Retirement.

Table 2: Mean Percentage of Clinically Depressed by Sex and Other Characteristics

		PRC	JAPAN	ROK
Gender	Men	29.4	14.3	22.9
	Women	44.0	16.4	29.8
Age	54–59	32.5	20.2	20.3
	60–64	39.7	12.9	20.5
	65–71	40.0	14.1	31.5
	72–78	37.3	13.8	39.5
Education	Illiterate	46.1	N/A	42.3
	Primary school	34.0	13.8	31.6
	Middle school	26.9	16.1	25.7
	High school	21.3	16.0	20.7
	College+	15.7	12.1	17.2
Marital status	Not married	50.0	19.8	40.8
	Married	34.3	12.3	23.5
Number of children	0	48.7	17.4	50.5
	1	26.3	18.1	25.8
	2	34.6	16.8	21.7
	3	38.4	11.3	26.9
	4	40.1	14.9	32.3
	5	47.0	20.2	32.7
	6+	41.8	15.0	38.8
Work status	Not working	38.1	17.7	34.6
	Working	35.4	13.0	17.3
Expect to receive pension	No	42.7	22.4	31.0
	Yes	31.6	15.1	23.4
Own home	No	36.6	19.4	33.8
	Yes	36.7	13.4	24.8
Any transfer to children [a]	No	37.5	15.1	26.2
	Yes	31.7	21.4	18.9
Any transfer from children [a]	No	34.9	15.2	23.2
	Yes	38.7	14.1	30.2
Frequent contact with children?	No	48.5	20.2	34.0
	Yes	35.4	13.7	24.8
Live nearby children?	No	34.5	16.1	29.9
	Yes	37.4	15.3	24.2
Living arrangement	Living alone	41.3	21.2	42.2
	Living with partner	33.7	12.5	24.8

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		PRC	JAPAN	ROK
	Living with children (with or without partner)	37.0	15.1	23.2
	Living with others	40.4	12.7	29.9
Frequent social activities	No	41.8	21.4	33.8
	Yes	31.5	12.4	22.3
Any ADL difficulty	No	31.0	15.0	25.6
	Yes	67.6	27.9	64.5
Hypertension	No	35.8	14.9	24.4
	Yes	39.0	16.8	31.8
Diabetes	No	36.1	15.3	25.2
	Yes	43.9	17.3	35.6
Cancer	No	36.6	15.3	25.8
	Yes	45.9	19.4	47.9
Lung disease	No	35.0	15.6	26.2
	Yes	50.0	14.5	40.4
Heart disease	No	34.4	14.7	25.5
	Yes	50.3	21.7	43.3
Stroke	No	36.0	15.2	25.8
	Yes	58.9	25.8	45.5
Arthritis	No	29.5	14.8	24.5
	Yes	50.4	24.7	37.9

ADL = activities of daily living, PRC = People's Republic of China, ROK = Republic of Korea.

[a] Any transfers to/from children among those who have children.
Source: Authors' estimates.

Table 3: Results from Linear Probability Model of Being Depressed

		PRC	Japan	ROK	F-stat
Base					3.66***
Male		-0.087***	0.029	-0.009	10.40***
Age 54–59 (ref)	60–64	0.019	-0.139***	-0.009	4.84***
	65–71	0.010	-0.191***	0.019	
	72–78	-0.029	-0.250***	0.046*	
Middle school (ref)	Illiterate	0.090***	-	0.068**	2.04**
	Primary school	0.046***	0.142*	0.033*	
	High school	0.008	0.023	-0.013	
	College+	-0.016	0.002	-0.018	
Married		-0.066***	-0.029	-0.084	
No of children		0.009	0.025	-0.024	
No of children^2		-0.002	-0.007	0.003	
Economic					1.61**
Working		-0.028***	-0.067**	-0.103***	4.68***
Consumption q4 (ref)	q1	0.033**	-0.015	0.005	0.85
	q2	0.023	-0.014	-0.029	
	q3	0.020	-0.020	-0.019	
Receive pension		0.048	0.027	0.018	1.21
Ln (1+pension income)		-0.013**	0.004	-0.016	
Expect to receive pension		0.005	-0.027	0.021	
Own home		0.156***	0.010	0.030	0.80
Ln (1+gross housing value)		-0.016***	-0.003	-0.007	
Ln (1+total debts)		0.005**	0.000	-0.002	1.42
Ln (1+total financial assets)		-0.008***	-0.004	-0.007***	
Social					2.10***
Ln (1+amount of transfer given)		-0.005**	-0.000	0.003	1.40
Ln (1+amount of transfer received)		-0.004**	-0.008	-0.002	
Frequent contact with children		-0.085***	-0.046	-0.019	3.49***
Frequent social activities		-0.043***	-0.074***	-0.092***	
Living with partner (ref)	Living alone	0.006	-0.011	0.407**	2.14**
	With children	-0.003	-0.018	0.029	
	With others	0.027	-0.028	0.000	
Living nearby children		0.020	-0.012	-0.028	
Health					2.01***
Any ADL difficulties		0.214***	0.171*	0.296***	0.03
Hypertension		0.015	0.045*	-0.012	2.37*
Diabetes		0.040**	0.077*	0.052***	0.12
Cancer		0.075	0.063	0.151***	1.97

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	PRC	Japan	ROK	F-stat
Lung disease	0.068***	0.211	0.064	1.83
Heart disease	0.100***	0.090**	0.093***	0.06
Stroke	0.112***	-0.043	0.055	3.76**
Arthritis	0.102***	0.097**	0.030	4.77***

ADL = activities of daily living, PRC = People's Republic of China, ROK = Republic of Korea.

Note: *** p<0.01, ** p<0.05, *p<.10.
Source: Authors' estimates.

Table 4: Results from the Linear Probability Model of Being Depressed on Basic Variables

Country	Variable	Base model	Base + Economic	Base + Social	Base + Health	Full model
PRC	Male	-0.106***	-0.100***	-0.111***	-0.083***	-0.087***
	Age 54–59 (ref)					
	60– 64	0.024**	0.032**	0.024*	0.007	0.019
	65–71	0.038***	0.041***	0.032**	0.004	0.010
	72–78	0.009	-0.002	0.006	-0.033**	-0.029
	Middle school (ref)					
	Illiterate	0.126***	0.107***	0.117***	0.113***	0.090***
	Primary school	0.062**	0.054***	0.058***	0.059***	0.046***
	High school	-0.020	-0.011	-0.011	-0.007	-0.008
	College+	-0.074***	-0.027	-0.057**	-0.067***	-0.016
	Married	-0.089***	-0.070***	-0.084***	-0.086***	-0.066***
	No. of children	-0.000	-0.001	0.018	-0.006	0.009
	No. of children^2	0.000	0.000	-0.002	0.000	-0.002
Japan	Male	-0.002	0.044	0.007	-0.002	0.029
	Age 54–59 (ref)					
	60–64	-0.070***	-0.122***	-0.082***	-0.073***	-0.139***
	65–71	-0.067**	-0.155***	-0.080***	-0.085***	-0.191***
	72–78	-0.083***	-0.233***	-0.100***	-0.104***	-0.250***
	Middle school (ref)					
	Primary school	-0.007	0.135	0.050	-0.022	0.142*
	High school	-0.022	-0.002	-0.005	-0.019	0.023
	College+	-0.053*	-0.027	-0.031	-0.054*	0.002
	Married	-0.072***	-0.022	-0.074**	-0.071***	-0.029
	No. of children	-0.007	-0.008	0.009	-0.004	0.025
	No. of children^2	0.000	-0.005	-0.003	-0.000	-0.007
ROK	Male	-0.019	0.017	-0.032**	-0.019	-0.009
	Age 54–59 (ref)					
	60–64	0.003	-0.012	0.004	-0.002	-0.009
	65–71	0.075***	0.025	0.074***	0.051***	0.019
	72–78	0.144***	0.052**	0.146***	0.104***	0.046*
	Middle school (ref)					
	Illiterate	0.098***	0.084***	0.094***	0.082***	0.068**
	Primary school	0.028*	0.036*	0.027	0.022	0.033*
	High school	-0.025	-0.017	-0.022	-0.022	-0.013
	College+	-0.055**	-0.031	-0.049**	-0.045*	-0.018

Continued on the next page

Country	Variable	Base model	Base + Economic	Base + Social	Base + Health	Full model
	Married	-0.095***	-0.097**	-0.055**	-0.099***	-0.084
	No. of children	-0.054***	-0.033*	-0.037**	-0.052***	-0.024
	No. of children^2	0.006***	0.004	0.005**	0.006***	0.003

PRC = People's Republic of China, ROK = Republic of Korea.

Note: *** p<0.01, ** p<0.05, *p<.10.
Source: Authors' estimates.

Table 5: Oaxaca Decomposition of Mean Country Differences in Depression Probability

	PRC–Japan	ROK–Japan	ROK– PRC
ROK		0.231	0.231
PRC	0.284		0.284
Japan	0.144	0.144	
difference	0.140***	0.087***	-0.053***
explained	0.116***	0.049***	-0.107***
unexplained	0.024	0.038*	0.054***
explained			
basic	0.010	0.027	-0.013**
economic	0.086***	0.029***	-0.041***
social	-0.023***	0.012	-0.002
health	0.044***	-0.018***	-0.050***
unexplained			
basic	0.048	0.005	-0.012
economic	-0.090	-0.087	-0.014
social	0.021	0.013	0.029
health	-0.005	-0.005	-0.012
_cons	0.050	0.113	0.063

PRC = People's Republic of China, ROK = Republic of Korea.

Note: *** p<0.01, ** p<0.05, *p<.10.
Source: Authors' estimates.

Table 6: Simulation Results—Mean Predicted Probability of Elevated Depressive Symptoms

		Coefficients		
	N	**PRC**	**Japan**	**ROK**
Covariates:				
PRC	4,679	0.300	0.429	0.360
Japan	1,276	0.160	0.147	0.272
ROK	3,591	0.195	0.307	0.235

PRC = People's Republic of China, ROK = Republic of Korea.

Source: Authors' estimates.

Table 7: Results from the Matching Analysis

Z		$E(Y_K - Y_J \mid Z)$	s.e	$E(Y_C - Y_J \mid Z)$	s.e.
Male		0.092	(0.027)	0.058	(0.027)
Age 54–59 (ref)	60–64	0.052	(0.039)	0.122	(0.045)
	65–71	0.082	(0.036)	0.126	(0.043)
	72–78	0.268	(0.175)	0.232	(0.181)
Middle school (ref)	High school	0.064	(0.028)	0.068	(0.037)
	College	0.072	(0.061)	0.006	(0.053)
Married		0.092	(0.023)	0.079	(0.023)
Working		0.032	(0.023)	0.071	(0.027)
Consumption Q4 (ref)	Q1	0.161	(0.044)	0.166	(0.05)
	Q2	0.019	(0.038)	0.085	(0.046)
	Q3	0.081	(0.034)	0.113	(0.039)
Expect to receive pension		0.077	(0.02)	0.059	(0.022)
Home ownership		0.087	(0.023)	0.097	(0.025)
Frequent contact with children		0.101	(0.022)	0.104	(0.023)
Frequent social activities		0.069	(0.022)	0.064	(0.023)
Living nearby children		0.087	(0.024)	0.102	(0.025)
Any ADL difficulties		-0.121	(0.124)	-0.254	(0.124)
Hypertension		0.085	(0.033)	0.093	(0.036)
Diabetes		0.108	(0.062)	0.060	(0.068)
Cancer		0.303	(0.101)	0.302	(0.128)
Lung disease		0.067	(0.141)	0.054	(0.133)
Heart disease		0.199	(0.064)	0.138	(0.06)
Stroke		-0.212	(0.104)	-0.143	(0.115)
Arthritis		0.019	(0.071)	-0.049	(0.074)

ADL = activities of daily living.
Source: Authors' estimates.

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Well-Being of Older People in East Asia

The People's Republic of China, Japan, and the Republic of Korea

This study examines the well-being of older people in the People's Republic of China (PRC), Japan, and the Republic of Korea (ROK) using microlevel data. It focuses on depressive symptom scales and the impact of demographic, economic, social, and health factors. Although much of the differences of the results across the three countries is due to the differences in the characteristics of older people, significant unexplained differences remain. In particular, even after accounting for several factors, older people in the ROK are more likely to be depressed than in the PRC or Japan.

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