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**WHAT MAKES PEOPLE ANXIOUS
ABOUT LIFE AFTER THE AGE OF 65?
EVIDENCE FROM
INTERNATIONAL SURVEY RESEARCH
IN JAPAN, THE UNITED STATES,
CHINA, AND INDIA**

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What makes people anxious about life after the age of 65?

Evidence from international survey research in Japan, the United States, China, and India[*]

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Abstract

This study investigated the causes of people's anxieties about life after the age of 65 years, using household data from countries with different social contexts: Japan, the United States, China, and India. This research added contextual aspects to the literature on social security and precautionary savings. An ordered probit model was used to establish the causes of anxiety and a generalized structural equation model was used to check the robustness of the results. This study uncovered three major findings. First, anxiety levels about life at an older age partly depend on people's views of the future. Second, high financial status lessens people's anxiety levels only if prices are stable. Third, living with a child, contrary to expectations, does not necessarily lessen people's concerns about life after 65.

Keywords: aging policy, social security, future concern, precautionary saving, comparative studies

JEL classification codes: E21; H53; I38

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1. Introduction

Easing people's concerns about growing old is one of the major challenges in social security research in the era of global aging. The causes of aging-related anxiety are often nebulous. This research cuts across different social contexts to investigate the reasons for anxiety about life after the age of 65 years.

Population aging has become a major concern in many countries. According to the Organisation for Economic Co-operation and Development (OECD 2006), the average ratio of people aged 65 and older to the population aged between 20 and 64 years (hereafter, the old-age dependency ratio) in OECD member nations is expected to increase from 22.9 % in 2000 to 46.3 % in 2040. This trend is expected to occur also in East Asia. The old-age dependency ratios in China, Thailand, and Indonesia are forecast to increase from about 10 % in 2000 to 40 %, 37 %, and 25 %, respectively, by 2040 (United Nations 2011). Furthermore, population aging will begin to affect even countries whose populations are growing, such as India. The old-age dependency ratio in India is expected to increase from about 10 % in 2000 to 17 % by 2040 (United Nations 2011). These trends may bring about, or exacerbate, serious social issues, including a shortage of labor and resources for necessary social services, such as long-term care that would eventually become necessary for substantially higher numbers of people.

Anxiety produces a substantial burden on individual wellbeing. The constant state of anxiety could seriously affect quality of life by restricting daily activities and difficulty in sleeping (Hoffman et al. 2008). In a serious state, anxiety could also lead to depression, phobias, panic, and other psychological disorders. Furthermore, anxiety could lead to irrational thinking, like excessive health concerns, wrong beliefs, and social isolation. Usually, the middle-aged groups of populations make significant contribution to societies by their direct involvement in the workforce and via their experience. Anxiety could impede the ability of these groups of people to contribute to their societies. Anxiety has social implications alongside economic implications. It could affect family and social relationships, causing those affected to cease to act as active and responsible members of family and society. The direct cost of medical care from anxiety-related health problems and the indirect costs from the loss of productivity constitute the economic loss of this anxiety (Hoffman

et al. 2008; Hu 2002). Overall, anxiety creates an economic burden and social imbalance in society. Therefore, it is natural for governments to be concerned about this problem.

A critical aspect of this problem is that governments need to find efficient ways to ease people's concerns about aging. To do so, they must first understand the causes of aging-related anxiety. Although social security systems help to lessen people's anxieties, the resources available to develop such systems will become more and more limited as the old-age dependency ratio increases. Thus, social security systems need to focus their resources on the direct causes of people's anxieties about growing old.

The existing literature confirms the negative impact of income uncertainty on consumption. When future income is not certain, consumers tend to deviate from their consumption levels attained at permanent income levels. In line with this economic theory, it is possible that anxiety about old age, more specifically, the anxiety about future financial conditions, could have negative impacts on the economy through reduced consumption. Menegatti (2007) found evidence that income uncertainty negatively affects consumption decisions. To reduce such negative impacts on consumption, Menegatti (2007) emphasized the importance of precautionary savings. Analyzing household data in the United Kingdom, Dardanoni (1991) proved that future income uncertainty decreases consumption and increases people's desires for precautionary savings, which negatively affects the national economy. Kazarosian (1997) and Carroll and Samwick (1998) endorsed this claim, using panel data on households in the United States. Social security, however, mitigates such negative effects by easing people's concerns about their financial future. Engen and Gruber (2001) provided evidence that the development of an unemployment insurance system eases the degree of concern for the future and decreases the amount of precautionary savings. Starr-McCluer (1996) claimed that withholding health insurance increases people's concerns about the future. All these findings point to the conclusion that it is important for governments to ease people's anxieties about the future.

It is noteworthy that middle-aged people are usually more concerned about old age than the old themselves are. A number of previous studies that have examined age differences in anxiety (e.g., Bland et al. 1998; Carta et al.

1991; Fichter et al. 1996; Jorm 2000; Weissman and Myers 1980;) claim that people in their 40s, 50s, and early 60s tend to be more anxious than those older than 65 years. Jorm (2000) explained that aging is associated with an intrinsic reduction of susceptibility to anxiety. Nonetheless, the anxieties of middle-aged people cannot be ignored, even though they may feel less anxious as they grow older. People in this age range are very important for the national economy, as they usually earn and spend more than other age groups. Moreover, they probably feel the most insecure owing to the current population trends that forecast an increase in the old-age dependency ratio.

What makes people anxious about their old age is uncertain; multiple factors, including the status of people's finances, families, and health, might be at work. A person's financial status determines his/her ability to purchase the necessary long-term care when he/she becomes older and physically weak. Family status, and the ability or willingness of families to care for older family members, may influence aging-related uncertainty. Grossbard (2014) stated that altruism was not the only factor that affects in-family caregiving. Exchanges of work for money or inter-generational monetary transfers also play significant roles in family caregiving. As a result, people could be anxious about life after the age of 65 even though they live with family members. Health risk status almost surely influences people's anxieties about old age, both in terms of fear of discomfort or death and in terms of increasing health care requirements. Furthermore, the measurement of all this uncertainty must be observable and exogenous in order to produce accurate data and to generate effective results (Browning and Lusardi 1996).

Past literature has established the effects of social norms and cultural traits on the reporting of social anxiety. Most studies have used collectivism and individualism as a proxy for cultural traits to examine whether social anxiety differs significantly across countries with different cultural backgrounds. Hofstede (1984, 2001) studied how collectivism and individualism shape the behavior of people. Collectivist countries place high importance on group affiliation and harmony and less importance on individual gain. People from collectivist countries often are found to take care of their relatives and other group members in addition to their own family members. On the other hand, individualistic countries have weak social

networks and place strong importance on individual achievements and success. Moreover, individualistic countries are found to be less tied with stringent social norms than collectivist countries (Argyle 1986). Thus, social norms and cultural traits, reflected in whether countries are either collectivist or individualistic, need to be examined to study people's social concerns, like anxiety (Hofmann et al. 2010). East Asian countries, like Japan and China, are considered collectivist countries whereas western countries, like the United States, are considered individualistic countries (Hofstede 2001). Heinrichs et al. (2006) and Okazaki (1997) reported that collectivist countries have greater levels of social anxiety than individualistic countries. A related study by Norasakkunkit and Kalick (2009) studied the behavior of 127 Japanese and 126 American participants to establish the effect of cultural differences on social anxiety and well-being. The Japanese participants, who were influenced by collectivism, were found to be more prone to social anxiety than the American participants, who were influenced by individualism. However, this relationship held true only for anxiety and not for well-being. Thus, the findings of these studies suggest that anxiety about old age could be related to cultural norms and traits.

Table 1 describes the differences in social contexts across Japan, the United States, China, and India. A very large portion of Japan's entire population is aged, while Japan has an expensive pension scheme and a universal long-term care insurance system. By comparison, although a large portion of the United States' entire population is also aged and covered by a comprehensive pension scheme, the long-term public care system is means-tested. The expectation is that China will shortly have a significant elderly population due to its long-standing one-child policy, yet its social security system is weak and underdeveloped. India's social security system is also weak; however, the speed of change in its old-age dependency ratio is moderate because of its very large numbers of young people.
(Insert Table 1 around here)

In these circumstances, it is important to find the causes of anxiety about old age and to find the factors responsible for cross-country differences. To this end, this study conducts cross-country research to provide evidence on the causes of anxiety after the age of 65 years. To conduct the study, first, a

questionnaire was designed to understand respondents' degrees of anxiety regarding their lives after the age of 65, and to gather data on the possible determinants of such anxiety, such as the status of their finances, families, and health. The questionnaires were distributed to households in accordance with the protocols used to obtain census data. Second, the research spanned countries with different social contexts: Japan, the United States, China, and India. Since this is a cross-country analysis and regression models are used separately for each country, the results should provide evidence of the causes for old-age anxiety that are unaffected by the cultural differences of the countries.

This study contributes to the existing literature in several ways. First, it provides new cross-country evidence for the causes of anxiety after the age of 65. Second, this study provides an opportunity to observe whether observed cultural differences in the sample countries affect the causes of older people's anxiety. Third, the results of this study provide important implications for policymakers to improve their understanding about the lives of old people.

The remainder of the paper is organized as follows. Section 2 describes the dataset and the data collection process in the sample countries. Section 3 presents the empirical models and results. Finally, Sections 4, 5, and 6 present the policy implications, discussion, and conclusion, respectively.

2. Data

This research used micro data from the Preference Parameters Study of Osaka University's 21st Century COE Program "Behavioral Macrodynamics Based on Surveys and Experiments" and its Global COE project "Human Behavior and Socioeconomic Dynamics." The study used a multi-stage sampling and allocation method while sampling the data. Appendix 1 shows the detailed discussion on the data collection and sample size determination process. While collecting the data, a nationwide survey was conducted for both Japan and the United States. However, the data for China came from six major cities, while that for India focused on five major cities. The data were collected between December 2011 and May 2012. A preference parameter study used different approaches to receive responses from subjects aged between 20 and 69 years. However, this research targeted respondents aged between 40 and 64 years

because previous studies found that respondents of this age group are more likely to be anxious about their old age (Carta et al. 1991; Fichter et al. 1996; Jorm 2000; Weissman and Myers 1980). Data collection methods included visits and placement surveys in Japan, mail surveys in the United States, and face-to-face interviews in both China and India. The response rates in Japan and the United States were 93.9 % and 75.3 %, respectively. The fact that Osaka University's survey project was a panel survey explains the high response rates in Japan and the United States. The panel survey started in 2009 and the present study used data from the survey's 2012 round.

Table 2 indicates the survey variables. One question measured the level of each respondent's anxiety about life after the age of 65, the dependent variable. Responses indicating the degree of anxiety ranged from 1 (least anxious) to 5 (most anxious). The independent variables are a proxy for the three risk factors mentioned earlier: financial status, represented by financial assets, housing, and social security; family status, represented by information on marital status and children; and health status, represented by exercise habits. There is little difference in the measurement of financial assets between the four countries. While conducting the survey, respondents from Japan and the United States were asked to choose a balance of financial assets from different ranges of asset values while respondents from China and India were asked to mention the approximate balance of the financial assets. The mean values of the scale in the questionnaire in Japan and the United States were used to measure financial assets, whereas, the actual values collected through interviews were used in China and India. The study measured levels of social security using the mid-point of the social security scale used in the questionnaire (Table 3). During the data collection process in China and India, researchers added the option "no security insurance" because many subjects in both countries gave that response. This is interpreted as zero coverage.
(Insert Table 2 around here)
(Insert Table 3 around here)
Table 4 shows the descriptive statistics. The variable describing financial assets indicates a huge gap between the developed nations in the study (Japan and the United States) and the developing ones (China and India).

The rate of home ownership is rather similar in all countries, but the extent of social security coverage for post-retirement living expenses is very low in India. In all four countries, the majority of the people indicated their family status as married. The percentages of those who lived with a child are the biggest in India, followed by China, Japan, and the United States. The United States has the biggest portion of people with exercise habits, whereas India has the smallest.

(Insert Table 4 around here)

3. Methodology

This study used an ordered probit regression model to establish the causes of anxiety after the age of 65 years. This model is a generalization of the probit model, which is suitable for situations with more than two outcomes of an ordinal dependent variable. The dependent variable, namely, the level of anxiety in old age, is an ordinal variable that is categorical and ordered. Since there are five possible ordered outcomes of the dependent variable, an ordered probit model is the best fit for this study. The non-linearity and ordered responses in the dependent variable cannot be controlled by the linear regression, and so, the ordered probit model used in this study should successfully establish the causes of anxiety after the age of 65.

Possible endogeneity bias in the ordered probit regression model is a concern for this study. The possibility of simultaneous causality between the dependent variable and some of the independent variables could reduce the strength of the coefficient values. For example, the variable "exercise" could produce simultaneous causality but the manner in which anxiety affects exercise is not as strong as the manner in which exercise affects anxiety. As a result, it seems that the magnitude of such simultaneous causality is not too strong to affect the coefficients of the regression equation significantly. Nevertheless, the generalized structural equation model was used to check whether endogeneity causes the coefficients to be biased.

4. Results

This section first discusses the respondents' degrees of anxiety about life after 65 years in each of the four countries. Figure 1 indicates the level of anxiety

by age group. People in the United States are the most optimistic about their old age in general, whereas people in India and Japan seem to feel the most insecure. In particular, older generations in India appear to be the most anxious about their lives as they age. In Japan, although younger generations seem to be considerably concerned about their future, older generations, such as those in the 55–59 year and the 60–64 year age groups, feel relatively secure. In China, the level of anxiety is consistently moderate throughout the generations, even though the old-age dependency ratio is expected to increase radically over the next few decades. The level of anxiety peaks in the age range of 55–59 years in the United States, China, and India but in Japan, it peaks in the range of 40–44 years.

(Insert Figure 1 around here)

We now turn to the causes of anxiety, analyzed using an ordered probit model (Table 5). First, only in Japan does the "age" variable significantly decrease anxiety, as seen earlier. Second, the "educ" variable significantly lowers anxiety in China. Third, the "assets" variable significantly decreases anxiety in Japan and the United States, endorsing the precautionary saving theories in the literature. Contrary to expectations, the "assets" variable *increases* anxiety in China. However, it has no significant effect in India. Fourth, whereas the "own housing" variable does not significantly affect anxiety in Japan and the United States, it significantly decreases anxiety in India, and contrary to expectations, significantly *increases* anxiety in China. Fifth, the "security" variable significantly decreases anxiety levels in Japan; so does the presence of a spouse. Sixth, the "exercise" variable significantly decreases anxiety in Japan and the United States.

(Insert Table 5 around here)

5. Robustness checks

Heteroscedasticity, two-way causation, and collinear variables are some common problems that can affect the regression coefficient of the ordered regression model. The robustness of the results obtained from the ordered regression was checked against these issues. The robust regression produced similar results to the original models. Although the values of the coefficients changed moderately, the levels of significance did not change and the overall

implication of the results remains the same (Table 6). Since the results of the ordered regression are robust, the causes of anxiety after the age of 65 years obtained from the regression equation need to be considered seriously.

(Insert Table 6 around here)

We used a number of independent variables in the ordered probit models, and thus, the possibility of endogeneity bias should be examined. As the endogeneity problem affects the value of coefficients, the causes of anxiety identified from the ordered probit model need to be free from endogeneity bias. We used the generalized structural equation model to check robustness against endogeneity problems. Table 7 shows the results of the generalized structural equation model. It appears that the value and significance of the coefficients are quite similar to those in the ordered probit model, which means that endogeneity problems did not cause bias in the estimation models.

(Insert Table 7 around here)

6. Policy Implications

Identifying the direct causes of people's anxieties about old age enables the suggestion of some policy implications. In order to ease aging-related anxieties, the governments of Japan and the United States should focus on (a) policies that increase people's financial assets (e.g., tax cuts) and (b) health promotion campaigns that encourage regular exercise. In addition, the Japanese government should focus on developing a generous social security/pension system. Finally, the Indian government should implement policies that facilitate home ownership (e.g., public home-loan programs).

7. Discussion

This study used ordered probit models to examine the causes of anxiety about life after the age of 65. In addition, the generalized structural equation model was used to check the robustness of the results against endogeneity problems. Several of the results presented in Section 3 are unexpected. First, people in China show little aging-related concerns despite the fact that the old-age dependency ratio is expected to increase without any corresponding development of social security. Second, a high level of financial assets lessens concerns about the future in the two developed nations (Japan and the United

States), but not in the two developing nations (China and India). In theory, the development of a social security system lessens people's concerns about the future. However, financial assets mitigate anxiety only in Japan and the United States, where the social security systems are comparatively well developed. Third, home ownership eases anxiety only in India. Since housing is an asset, those who own their own homes, generally, should feel more secure than those who rent, but that was the case only in India. Fourth, living with a child did not significantly lessen anxiety in any of the four countries. These results contradict the traditional concept of regarding one's children as potential old-age caregivers. The following sub-sections investigate possible reasons underlying these enigmatic results.

7.1 Reasons behind the optimistic outlook of people in China

The moderate level of anxiety about old age in China may be partly due to people's general views about the future. The research survey contained one extra question, asking subjects to rate their agreement with the following sentence: "Since the future is uncertain, it is a waste to think about it." Figure 2 shows the answers from 1 ("completely disagree") to 5 ("completely agree"). Whereas the majority of people in the United States and Japan rather disagreed with the sentence, people in China, in particular, rather agreed with it. Since people in China generally do not place value on thinking about the future, they are not anxious about their lives in old age, despite China's rapidly aging population and its underdeveloped state of social security.

Nonetheless, this does not necessarily explain the uniqueness of China. Contrary to expectations, the level of financial assets and home ownership uniquely increase the level of anxiety in China. Further studies and detailed investigations are required to explain this result.
(Insert Figure 2 around here)

7.2 Reasons behind the effect of a high level of financial assets in China and India

Part of the reason for the unexpected effects of financial asset levels in China and India may lie in their economic trends. For example, Figure 3 shows trends in the consumer price index (CPI) in the four nations. Only in Japan and

the United States has the CPI remained stable over the last several years; in China and India, the value of money has changed dramatically. This may explain the reason why current financial status does not mitigate concerns for the future in China and India. Precautionary saving theories require a stable CPI trend.

(Insert Figure 3 around here)

7.3 Reasons behind the minimal effects of home ownership

The fact that the majority of people in Japan, the United States, and China already own their own homes, as seen in Table 4, may explain the home ownership results in these countries. Likewise, the fact that few people own their own homes in India may be the reason behind the results there. Moreover, according to the Knight Frank Global House Price Index (2010, 2011), real estate prices in Japan, the United States, and China have been either decreasing or trending toward step-down (Table 8). With these trends, home ownership does not necessarily make people feel secure about the future. On the other hand, real estate prices in India have been increasing. Thus, real estate facts and trends seem to explain why home ownership significantly lessens anxiety only in India.

(Insert Table 8 around here)

7.4 Reasons why living with children did not lessen anxiety

Many parents, contrary to common expectations, may not expect their children to provide long-term care. According to a Japanese survey of 1,092 adults, conducted by Daiichi-Life Insurance (2012), there is a huge gap between parents and children in terms of their beliefs and opinions about who should be the caregivers (Figure 4). About 30 % of children think that they should provide their parents with long-term care, whereas only 2.8 % of parents think that way. Parents in Japan do not expect their children to take care of them, even though their children may think they do. This gap might have influenced the unexpected outcome for Japan in this category. However, no such data are available for other countries. This warrants further investigation of differences in family dynamics, expectations, attitudes towards children, and differences in the values placed on independence, compliance, and obligation.

(Insert Figure 4 around here)

8. Conclusions

In order to respond to the social security needs of increasingly aging populations, many governments need to focus their limited resources on the direct causes of people's anxieties about aging. Using an ordered probit model, this study investigated the causes of people's anxieties about life after the age of 65 years using household data from countries with different social contexts: Japan, the United States, China, and India. In addition, a generalized structural equation model was used to check the robustness of the results. The research uncovered three major findings. First, levels of anxiety about life at an older age partly depend on people's general views about the future. The general apathetic attitude to the future in China explains why people in China were not very concerned about their lives in old age, despite expectations that the nation will face rapid population aging without a corresponding improvement in the development of social security. The precautionary saving theory requires people to have a considerable amount of interest in the future. Second, high financial status lessens anxiety only if prices are stable. In Japan and the United States, where the CPI has been stable, high financial status effectively reduced anxiety, whereas high financial status did not work to reduce anxiety in China or India, where the CPI has been unstable. Unless the CPI remains the same for several years, people will not feel secure because of their current financial status. A similar principle can be applied to home ownership. Home ownership did not significantly reduce anxiety in Japan, the United States, or China, where housing prices were declining (or off their peak) at the time of the survey, whereas it effectively lessened anxiety in India, where housing prices were increasing steadily at the time of the survey. Third, living with children did not necessarily lessen people's concerns about life after 65 years. Many parents, contrary to common expectations, did not expect their children to provide them with long-term care.

This research has several limitations. First, only the major cities in China and India were surveyed, whereas the data for Japan and the United States were based on nationwide surveys. The results for China and India might have been different if the data had covered rural areas. Second,

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self-reported subjective anxiety levels might be influenced by culture. In some cultures, people tend to make extreme choices (i.e., 1 or 5 choices on a 5-point scale), whereas in other cultures, people like to make moderate choices (i.e., 3). The differences we found might have been influenced by culture, and not necessarily economic context. Third, the variable "exercise" might be subject to reverse causation. Some people might exercise regularly because they feel anxious about the future[‡]. Fourth, the data collection method involves mailing respondents in the United States, which could affect the results.

Nonetheless, this research adds contextual aspects to the literature on social security and precautionary savings. Aging-related anxiety is affected by people's general views about the future and economic trends, such as trends in the CPI and housing prices. Governments need to take these factors into account in order to identify the causes of aging-related anxiety.

The research results provide the platforms to investigate further the different causes of aging-related anxieties in these four countries, or to expand research into other contributing factors and/or the unique political, social, and economic contexts of other countries. Ultimately, such research could contribute to the improvement of people's lives as they move into their later years.

Conflict of interest   This author declares that he has no conflict of interest.

[‡] However, I have not found any literature that suggests anxiety may cause people to exercise.

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Appendix 1
Details of the Data Collection Method
Japan

In the Japan study, nationwide visit-placement surveys of individuals and households were conducted from January to March 2012. The target respondents were between 20 and 69 years. Two-stage stratified random sampling was applied. First, the prefectures of Japan were divided into 10 regional blocks: Hokkaido, Tohoku, Kanto, Koshinetsu, Hokuriku, Tokai, Kinki, Chugoku, Shikoku, and Kyushu. Then, each of the 10 regions was sub-divided into the following four strata: government-designated major cities, cities with populations of more than 100,000, cities with populations of less than 100,000, and towns and villages. From this dataset, 2,579 observations were chosen covering 40–64-year olds with no missing answers.

The United States

In the United States study, mail surveys were sent to individuals and households all over the nation, except to the states of Alaska and Hawaii, between January and March 2012. The target respondents were 18 years or older. Multi-stage sampling was applied. The population was split into 36 different sample universes based on age group, gender, and race ethnicity. From this dataset, 1,190 observations were chosen. The observations covered 40–64-year olds with no missing answers.

China

In the China study, face-to-face interviews were conducted in six major cities—Beijing, Shanghai, Guangzhou, Chengdu, Wuhan, and Shenyang—from December 23, 2011 to January 21, 2012. The target respondents were adults between 20 and 70 years of age. A multi-stage sampling and allocation method was used. First, numbers of responses were predicted based on the target population in each district using the Statistical Yearbook. Then, an area in each district was selected randomly. Finally, using the Kish Grid method, individuals were chosen to be interviewed. From this dataset, 735 observations were chosen covering 40–64-year olds with no missing answers.

India

In the India study, face-to-face interviews were conducted in six major cities—Delhi, Mumbai, Bangalore, Chennai, Calcutta, and Hyderabad—between January and March 2012. The target respondents were adults between 20 and 69 years of age. A multi-stage sampling and allocation method was used. Each city was divided into four quadrants (north, south, west, and east) and each section was stratified into separate categories by gender, age group, and socioeconomic characteristics. Finally, the numbers of responses were set to be collected randomly within each stratum. From this dataset, 493 observations were chosen. The observations covered 40–64-year olds with no missing answers.

Figure 1: Level of anxiety by age group

Responses indicating the degree of anxiety ranging from 1 (least anxious) to 5 (most anxious).

Fig. 1
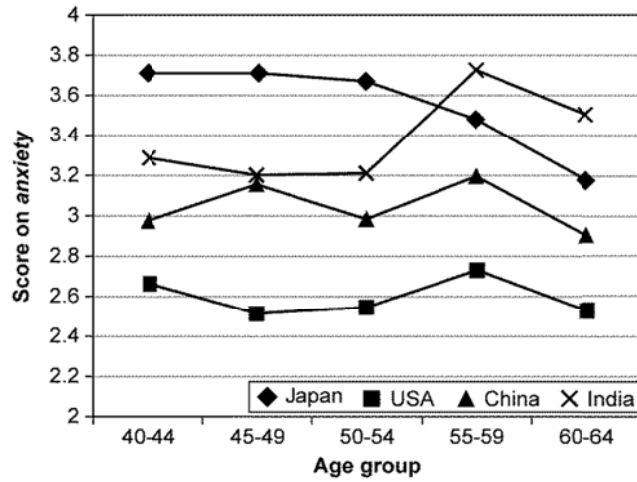
Figure 2: Views about the future by age group

Responses to the question "Since the future is uncertain, is it a waste to think about it?" ranging from 1 (completely disagree) to 5 (completely agree).

Fig. 2
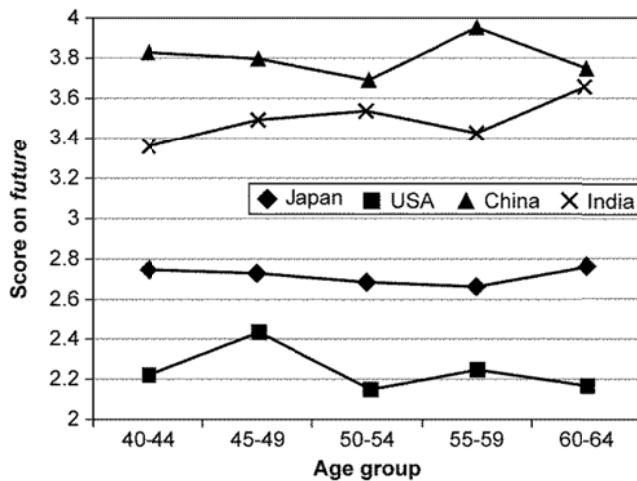
Figure 3: Trend of CPI in subject nations

Fig. 3
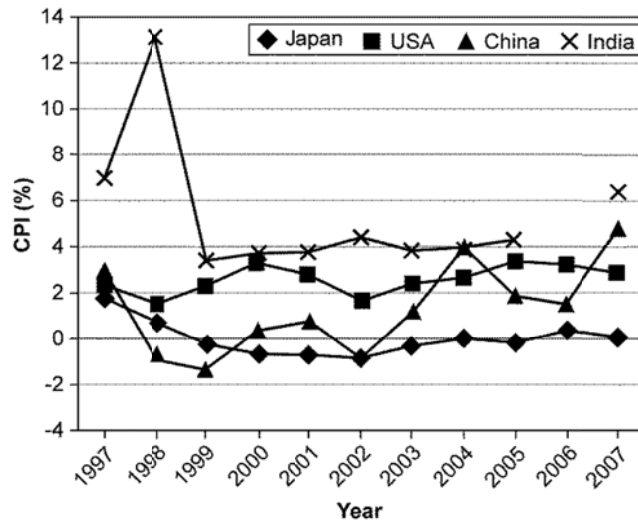
Source: Ministry of Internal Affairs and Communications, Government of Japan (2010)
CPI: Consumer Price Index

Figure 4: Answers to the question "Who should take care of an old parent?" in Japan

Fig. 4
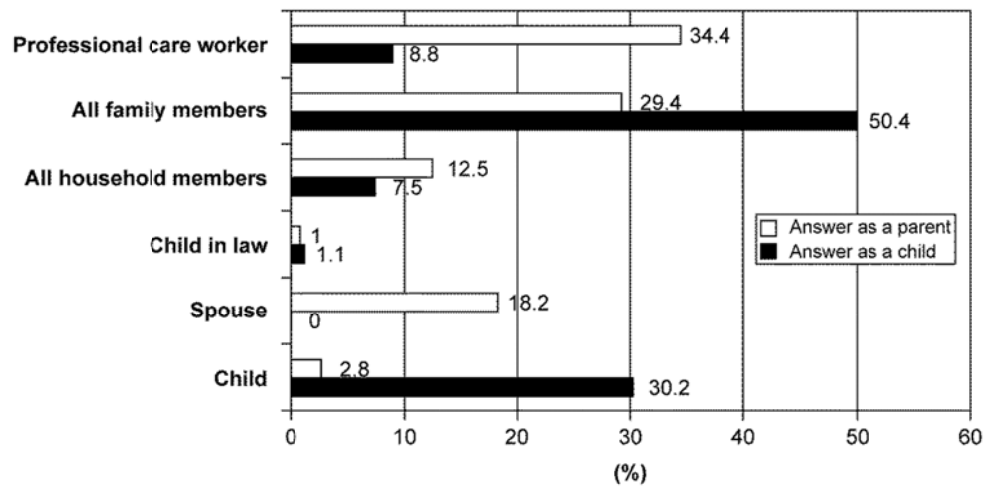
Source: Daiichi-Life Insurance (2012)

Table 1. Cross-country differences in context

	Speed of Aging	Public long-term care program	Coverage of mandatory pension schemes by labor force (%)
Japan	Very fast	Long-Term Care Insurance (Universal)	95.2
United States	Fast	Medicaid (Means-tested) Medicare (Limited Means-tested)	92.1
China	Very fast	*Underdeveloped*	20.7
India	Moderate	*Underdeveloped*	9.2

Sources: Data on the speed of aging are from the United Nations (2010). The OECD (2005) provides data on the nature of public long-term care programs in Japan and the United States. Data on the percentage of the labor force covered by mandatory pension schemes are from the OECD (2012).

Table 2. Variables

Variable	Definition
(Dependent Variable)	
anxiety	How much do you agree with the following sentence? (5 being the maximum and 1 the minimum) I have anxieties about my "life after I turn 65"* *(For those who are already 65 or older, "future life.")
(Independent Variables)	
male	1= male, 0 = female
age	
educ	Years of education
asset_1000usd	Balance of financial assets (savings, stocks, bonds, insurance, etc.) of the entire household (the value was converted to US dollars using the exchange rates as of February 2012: 1 JPY = 0.0128 USD; 1CNY= 0.159 USD; and 1 INR = 0.018 USD).
ownhousing	1= own, 0 = otherwise
security	Expected social security (pension) income for total living expenses after retirement (%)
spouse	1= married, 0= otherwise
childlt	1= living with child(ren), 0= otherwise
exercise	1= exercising at least once a week, 0 = otherwise.

Table 3. Scale of expected coverage of social security for living expenses after retirement

Scale used in data collection	Medium value
0–9%	0.045
10–19%	0.145
20–29%	0.245
30–39%	0.345
40–49%	0.445
50–59%	0.545
60–69%	0.645
70–79%	0.745
80–89%	0.845
90% or more	0.950
No social security*	0.000

*This choice was available only in China and India.

Table 4. Descriptive statistics

Japan					
Variable	Obs	Mean	Std. Dev.	Min	Max
age	2579	52.59364	7.259945	40	64
male	2579	0.464133	0.498809	0	1
educ	2579	13.34781	2.017237	9	21
asset_1000usd	2579	148.9013	219.6319	0.001267	1280
ownhousing	2579	0.89841	0.302167	0	1
security	2579	0.483562	0.253654	0.045	0.95
spouse	2579	0.856534	0.350616	0	1
childlt	2579	0.65413	0.475744	0	1
exercise	2579	0.354401	0.478424	0	1
United States					
age	1190	52.55882	6.733006	40	64
male	1190	0.473109	0.499486	0	1
educ	1190	13.6584	1.687133	9	18
asset_1000usd	1190	189.8424	254.4606	12.5	1000
ownhousing	1190	0.839496	0.367227	0	1
security	1190	0.397916	0.26225	0.045	0.95
spouse	1190	0.727731	0.445315	0	1
childlt	1190	0.368908	0.482712	0	1
exercise	1190	0.687395	0.46375	0	1
China					
age	735	52.17687	7.44105	40	64
male	735	0.480272	0.499951	0	1
educ	1093	10.89204	2.786884	0	16
asset_1000usd	735	15.97712	21.50263	0	159
ownhousing	735	0.794558	0.4043	0	1
security	735	0.368157	0.244093	0	0.95
spouse	735	0.922449	0.267646	0	1
childlt	735	0.657143	0.474988	0	1
exercise	735	0.670748	0.470262	0	1
India					
age	493	53.88438	9.295555	40	71
male	493	0.448276	0.497823	0	1
educ	493	8.543611	4.846487	0	18
asset_1000usd	493	12.54504	28.09773	0	477
ownhousing	493	0.63286	0.482515	0	1
security	493	0.076045	0.172661	0	0.95
spouse	493	0.776876	0.416764	0	1
childlt	493	0.675456	0.46868	0	1
exercise	493	0.263692	0.441082	0	1

Table 5. Estimation results

Ordered probit	Japan anxiety	United States anxiety	China anxiety	India anxiety
anxiety				
age	-0.0160***	0.00174	-0.00718	0.0143**
	(-4.89)	(0.34)	(-1.11)	(2.48)
male	0.0310	0.0412	-0.0688	0.0430
	(0.73)	(0.67)	(-0.86)	(0.42)
educ	-0.0117	0.00194	-0.0289*	-0.00311
	(-1.08)	(0.10)	(-1.70)	(-0.28)
asset_1000usd	-0.000920***	-0.000366***	0.00514***	-0.0000112
	(-9.24)	(-2.78)	(2.79)	(-0.01)
ownhousing	-0.116	0.0299	0.172*	-0.317***
	(-1.63)	(0.34)	(1.73)	(-3.13)
security	-0.332***	-0.0163	-0.215	-0.0603
	(-3.83)	(-0.13)	(-1.33)	(-0.20)
spouse	-0.316***	-0.137*	0.0227	-0.0977
	(-4.79)	(-1.83)	(0.15)	(-0.74)
childlt	0.0417	-0.0660	0.00253	0.00765
	(0.84)	(-0.92)	(0.03)	(0.07)
exercise	-0.0818*	-0.148**	0.125	0.118
	(-1.85)	(-2.21)	(1.42)	(1.06)
cut1				
_cons	-3.509***	-0.765**	-2.335***	-0.895**
	(-14.13)	(-2.07)	(-4.93)	(-2.38)
cut2				
_cons	-2.648***	-0.208	-0.885*	-0.420
	(-10.83)	(-0.56)	(-1.90)	(-1.13)
cut3				
_cons	-1.826***	0.514	-0.0552	0.586
	(-7.53)	(1.39)	(-0.12)	(1.58)
cut4				
_cons	-0.690***	1.273***	1.055**	1.468***
	(-2.86)	(3.43)	(2.25)	(3.91)
N	2579	1190	735	493

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 6. Estimation results to check robustness

	Japan	United States	China	India
age	-0.01595 (-4.87)***	.001739 (0.34)	-.0071834 (-1.12)	.0143335 (2.26)**
male	0.031004 (0.73)	.0412337 (0.67)	-.068825 (-0.85)	.0430048 (0.43)
educ	-0.01168 (-1.06)	.001944 (0.11)	-.0289111 (-1.74)*	-.00311 (-0.26)
asset_1000usd	-0.00092 (-9.44)***	-.0003658 (-3.14)***	.0051416 (3.31)***	-.0000112 (-0.01)
ownhousing	-0.11631 (-1.62)	.0298913 (0.31)	.1716625 (1.74)*	-.3167527 (-3.30)***
security	-0.33165 (-3.77)***	-.0162509 (-0.13)	-.2147011 (-1.47)	-.0603341 (-0.19)
spouse	-0.31572 (-4.96)***	-.1372901 (-1.84)*	.0226523 (0.13)	-.0976962 (-0.75)
childlt	0.041691 (0.85)	-.0660098 (-0.94)	.0025267 (0.03)	.0076523 (0.06)
exercise	-0.08177 (-1.86)*	-.148337 (-2.19)**	.1245074 (1.38)	.1175404 (1.08)
n	2579	1190	735	493
Pseudo R2	0.0324	0.0059	0.0088	0.0129

t statistics in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 7. GSEM results to check robustness against endogeneity problem

	Japan	United States	China	India
age	-0.0159 (-4.89)***	0.0017 (0.34)	-0.0071 (-1.11)	0.0143 (2.48)**
male	0.0310 (0.73)	0.0412 (0.67)	-0.0688 (-0.86)	0.0430 (0.42)
educ	-0.0116 (-1.08)	0.0019 (0.10)	-0.0289 (-1.70)*	-0.0031 (-0.28)
asset_1000usd	-0.0009 (-9.24)***	-0.0004 (-2.78)***	0.0051 (2.79)***	-0.00001 (-0.01)
ownhousing	-0.1163 (-1.63)	0.0298 (0.34)	0.1716 (1.73)*	-0.3167 (-3.13)***
security	-0.3316 (-3.83)***	-0.0162 (-0.13)	-0.2147 (-1.33)	-0.0603 (-0.20)
spouse	-0.3157 (-4.79)***	-0.1372 (-1.83)*	0.0226523 (0.15)	-0.0976 (-0.74)
childlt	0.04169 (0.84)	-0.0660 (-0.92)	0.0025 (0.03)	0.0076 (0.07)
exercise	-0.0817 (-1.85)*	-0.1483 (-2.21)**	0.1245 (1.42)	0.1175 (1.06)
n	2579	1190	735	493

t statistics in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 8. House price indexes

	Q1 2010–Q1 2011	Q1 2009–Q1 2010
Japan	−3.6%	−4%
United States	−4.9%	2.3%
China (Beijing and Shanghai)	8.4%	68%
India	21.9%	8.4%

Source: Knight Frank (2010, 2011)