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Determinants of Public Attitudes in Japan

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Determinants of Public Attitudes in Japan[ξ]

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Abstract

This study analyses public attitudes towards the degree of government involvement in ensuring the livelihood and care of the elderly in Japan. Using four waves of individual-level annual data from the Japanese General Social Survey collected over the period 2000-2005, we estimate ordered logit models with various explanatory variables based on the socio-demographic, economic, political, and social background of the respondents. Many significant factors are common for both livelihood and care specifications, their effects being qualitatively the same and in line with our prior expectations. The estimation results also show positive coefficients of year intercept dummies, implying an increase in support of a government-based system over time. Further investigation shows that this trend is caused by those who favour government redistribution policies becoming increasingly more consistent in their support for a government-based social security system in Japan.

JEL: H55, Z10

Keywords: Livelihood of elderly, care of elderly, public attitudes, aging societies, Japan

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1. Introduction

One of the greatest challenges facing Japan today is the reform of its social security system. As society ages rapidly, some fundamental laws of demography have now become apparent even to the general public. In addition, the system is afflicted by political scandals. In 2004, many top politicians were reported to have not paid their public pension premiums for a number of years, and were forced to resign from their government and party positions. Further, a record-keeping blunder of the public pension system was uncovered in 2007 revealing some 50 million unidentified pension accounts, greatly damaging its credibility. A measure to reduce the health insurance expenditure on those aged 75 years and older has raised vehement opposition from among not only that group, but also medical professionals, the media at large, and politicians including some from the ruling coalition. The government is rigorously seeking a reform plan to make the system sustainable in the long-term, while cleaning-up the political mess in the short-term. Various opinions have been voiced as to what would be the optimal reform plan. However, it seems to be that Japanese are more and more sceptic and uneasy about their social security system.

There are many studies to date that have investigated the effects of the current system and possible reforms.[1] However, there is very limited research focusing on people's opinions with respect to the government's involvement in the provision of old-age livelihood and care.[2] A notable exception is Kikuzawa (2005), who investigates the issue of attitudes towards the livelihood of the elderly across several countries. She finds that the Japanese level of preference for government involvement in the organisation of the pension system is higher than that in the US, Australia, and Canada, but lower than that in European countries. She also reports that, among many possible factors, only the lowest educational achievement (primary school enrolment only) has a significant, positive effect on respondent preferences.[3] Hayo and Ono (2007) note some methodological weaknesses of the study by Kikuzawa (2005) and take up the issue in the framework of a comparative empirical study between

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[1] Notable examples include: Aso (2000), Hatta and Oguchi (1999), Kawase et al. (2007), Komamura et al. (2000; Chapter 3), and Suzuki et al. (2005) for public pensions; Tokita (2004), Oguro (2007), and Iwamoto and Fukui (2007) for health and long-term care.

[2] There exist several opinion surveys/studies on social security in general, but they tend to be mainly descriptive and do not conduct formal econometric analyses (see, e.g., Ministry of Economy, Trade, and Industry (2006)).

[3] For the preferred level of fiscal expenditure, she finds that self-employed status also has a significantly negative effect on respondent choice.

Germany and Japan.[4] Among other factors, age, higher income, and part-time worker status make people more inclined towards the individual option, while retiree status does the opposite. Tachibanaki et al. (2006) collected their own survey data, concluding that respondents have a high expectation of the government for the provision of social security, and that the expectation is greatest for pension and lowest for long-term care. However, they draw these conclusions from the ratio of responses only and do not conduct any formal econometric analysis.[5]

Arguably, the success of economic reforms, at least in a democracy, is dependent upon people's opinions. In this sense, investigations of the expected objective effects do not suffice. Research on subjective aspects of social security reform is essential for shedding light on whether: (i) a reform plan would be accepted by various segments of society; and (ii) a gap exists between the expected objective developments and subjective perception. Based on these fundamental questions, this study attempts to identify various factors in the formation of the opinion on the livelihood and care of the elderly in Japan, using several waves over the period 2000 to 2005 of a representative public opinion survey.

More specifically, we use the individual-level data from the Japanese General Social Survey (JGSS), conducted by the Osaka University of Commerce. This survey asks opinions on the desired degree of government involvement in providing for the livelihood and care of the elderly. The focus of the present study is to identify which of various factors of the respondents, namely, socio-demographic (such as age or level of education), economic (such as personal income or employment status), political (such as support for a political party or attitudes towards the role of government in redistribution), and social variables (such as opinion on three generations living together or satisfaction with family life), help to explain attitudes towards organisation of the social security system in Japan.

It should be noted that the present study is not about any particular reform plan. Rather, it provides insight into the fundamental attitudes towards implementing a government- or individual/family-organised system. Such fundamental attitudes strongly affect people's

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[4] For Japan, they use the 2003 wave of the same survey data as the present study, while for Germany they employ the representative survey data set "Deutschland vor der demographischen Herausforderung" (Germany facing the demographic challenge) initiated in 2004 by the Bundesverband deutscher Banken (Association of German Banks).

[5] For studies on attitudes towards organisation of the pension system in other countries, see Boeri et al. (2001, 2002), Evans and Kelly (2005) and van Els et al. (2003). For an analysis of the provision of nursing care for the elderly in Spain, see Costa-Font et al. (2008).

reactions to any specific reform plans. While one can construct *a priori* hypotheses on the possible impact of certain individual characteristics on these fundamental attitudes, it remains an empirical question as to whether these actually hold up in practice. It certainly would be risky to put forward reform policies based on assumptions not validated by empirical tests. By focusing on the subjective aspects of social security reforms and establishing the way individual characteristics affect the fundamental attitudes towards the organisation of pension, and health and long-term care systems for the elderly, this study contributes to an under-researched but nevertheless important field.

The rest of the paper is organized as follows: Based to a large extent on the rational actor assumption, the second section develops theoretical hypotheses about which factors are likely going to affect the attitudes towards organisation of the social security system for old people. The third section explains the survey and data in detail. After briefly discussing the employed econometric methodology, Section 4 reports and interprets the estimation results for the assumption of time-invariant coefficients. Section 5 repeats the analyses allowing for heterogeneity of influences over time. In Section 6, the marginal effects of the identified influencing factors are analysed. The final section concludes the paper with a summary, some caveats, and a few avenues for future research.

2. Data Set

The data set we use in this study is the Japanese General Social Survey (JGSS) - the first of its kind in Japan - which contains similar questions to those found in the US General Social Survey. The JGSS is organised by the Institute of Regional Studies, Osaka University of Commerce, and the Institute of Social Science, University of Tokyo.[6] It is a nationwide representative survey collected using a two-stage stratified random sampling process, with stratification based on population (of those aged 20 - 89), region, and by size of cities/districts. In the present study, we use all available rounds of the JGSS sampled in 2000, 2001, 2002, 2003, and 2005.

In the following, we study two dependent variables that are based on the questions:

Who do you think should be responsible for the following?

    A) Livelihood of the elderly

    B) Health and long-term care of the elderly

Answer categories:

    1: Individuals and families ← 2, 3, 4, → 5: Government

Note that answers are coded in such a way that higher numbers indicate greater support for delegating responsibility to the government.

Table 1 presents a summary of the average frequencies over the sample period for the answer categories. These figures indicate that in Japan a majority of people opt for a mixed system to finance the livelihood of the elderly. If we concentrate on the sum of the frequencies to the right and left of the middle category, there is a stronger preference for a government-based system by 23 percentage points. Looking at the attitude towards provision of care reveals a somewhat different outcome: a majority of respondents are in favour of leaving care in the hands of the government. Ignoring the middle category and adding up the two options to the left and right, respectively, there is a 39 percentage point difference between the two options.

Table 1: Answer frequencies of responsibility for livelihood and care of the elderly

	Individual/family	↔	↔ both ↔	↔	Government
Livelihood	8%	13%	35%	25%	19%
Care	5%	9%	33%	31%	22%

Note: Number of observations: Livelihood: 12,486; Care: 12,488.

To facilitate the comparison over time, Figure 1 condenses the information of the five-item scale into simple averages of the two variables of interest. It shows that over the sample period the average adult Japanese prefers a more government-oriented system, both for ensuring the livelihood as well as the care of the elderly. There is a particularly noteworthy upward jump from 2001 to 2002.[7] In the actual empirical analyses below we investigate whether attitudes to this question can be explained employing socio-demographic, economic, and political variables.

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[7] The line shown in the graph is based on the means of the two variables. While the focus on an average can be misleading in principle, note that in the present case the development of the means is consistent with the development of the underlying frequencies for the respective categories.

Figure 1: Average support for a government-based system for livelihood and care of the elderly over time
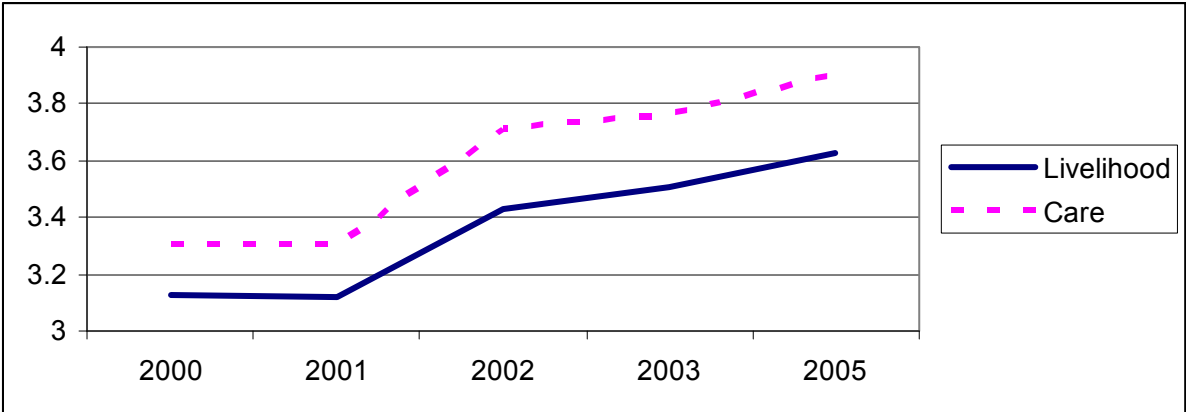
Notes: Number of observations: Livelihood: 2000: 2,869, 2001: 2,775, 2002: 2,909, 2003: 1,940, 2005: 1,993; Care: 2000: 2,869, 2001: 2,776, 2002: 2,909, 2003: 1,943, 2005: 1,991.

3. Developing Testable Hypotheses

There exists no full-fledged theory on people's attitudes towards government involvement in the livelihood and care of the elderly. Nevertheless, it is useful to structure the analysis by developing *a priori* hypotheses about possible explanatory variables based on the assumption of rational actors and/or established patterns of behaviour departing from this assumption.[8] From this hypotheses set, we discuss those that allow for empirical operationalisation given that the survey questions are available for a five-year sample period.

Age: We argue that age is one of the most important variables affecting the opinion for two reasons. First, it captures a *cohort effect*, the effect of the respondent being in a particular cohort, the members of which are at a particular age during the time of sampling. The cohort members are influenced by the dominant norms of the society at their time of socialisation. Second, age can also capture a *life-cycle effect*, which reflects the changes in economic constraints and perhaps preferences occurring over a life-time.[9] We conjecture that the cohort effect is negative in both the livelihood and the care of the elderly, because Japan was a more conservative society in the past, particularly before World War II, valuing individual/family responsibility in many aspects of the society at that time. We suspect that the direction of the life-cycle effect is positive both for livelihood and care of elderly. Older people support the public social security system more, because they have already paid in a

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[8] The results of the related work by Hayo and Ono (2007) also give some guidance.

[9] For example, entering the labour market, and thereby paying taxes and social insurance premiums, may make people more aware of the economic constraints involved. As an illustration for the possibility of changes in preferences, assume, for instance, hyperbolic discounting by individuals. At an early age, very few persons would think about their livelihood and care when they become old. After moving into adulthood, more concrete attitudes about who should support them after retirement will be formed, as the life-cycle phase of old age gradually starts to have an impact on the individual's utility calculus.

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large amount of contributions. Empirically, it is difficult to separate cohort and life-cycle effects when age is the only relevant variable in a repeated cross-section study, as we argue in the next section. Moreover, answers will be affected by how the respondent interprets the questions about the social security system: Either asking opinion on the responsibility of the individual or government *in general* or concerning *personal* situation. It is likely that in the former case, answers will be dominated by cohort effects, whereas in the latter case life-cycle effects will be stronger.

Gender: Men and women may develop different attitudes and opinions towards the livelihood and care of their old age. Before becoming old, men may work, earn, and possibly save more for their old age than women. On the other hand, women may spend more time with their family and develop stronger bonds with them. Women may also tend to be more integrated into social networks. Thus, a male-female difference would depend on one of these motives being stronger than the other.

Marital status: If people choose not to get married, they will have no family support to rely on when they become old. They can only resort to their private savings or depend upon the public system. Thus, from this insurance point of view, our hypothesis is that married persons would be relatively more in favour of individual/family-based systems than those single.

Number of children: If people have offspring, they can rely on them for old-age support, at least in principle. The more children they have, the better diversified is the "insurance" they have for their old age. Thus, we conjecture that they rather oppose the public support option.

Education: More educated people know better where and how their taxes and contributions are used than those not. Therefore, they may tend to view the public system more critically. They may also be more likely to think about their life from an intertemporal perspective and be more aware of the economic life-cycle, while less educated people may naively expect more support for their livelihood from a public social security system. Therefore, our hypothesis is that educated people prefer a more privately-organised system. This argument is less compelling in the case of old-age care. The survey asks about the highest level of education under both the old and new education systems.[10] We combined the two systems and created four dummy variables: mandatory school, secondary education, higher education (college), and higher education (graduate school).

Personal finance: In general, whether a person is financially secure should have an influence in shaping her opinion. Our conjecture is: the more financially secure a person is, the more she is able to support herself and thus the less she is inclined to support

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[10] In pre-World War II Japan, children had to choose an academic or vocational track if they wanted to pursue further education after 6 years of mandatory education. In 1947, the occupation forces overhauled this two-track system into a US-style single-track system, extending the mandatory education to 9 years.

dependence on social security. The various dimensions of personal finances are measured with the help of several questions in the survey detailed below.

(1) *Own employment status*: Employment directly affects a person's financial security. We identify the respondent's employment status using ten different categories.[11] If people do not work – and thus do not receive a regular income – they have less means to support their life now *and* when they become old. Japan has seen a tremendous increase in non-regular workers including part-time workers – estimated to make up about 30% of the total workforce in 2004 – who do not have automatic access to old-age pensions. Therefore, it is natural to assume that on average the unemployed tend to rely more on the public sector, both today and in the future. To the extent that part-time jobs are characterised by a lesser degree of job stability than full-time jobs, a similar situation is likely to emerge. In contrast, full-time employees in large corporations in Japan still benefit from "life-long employment". Thus, our hypotheses are that the unemployed will more strongly favour government responsibility, followed by part-time workers. Contrary to that, we expect full-time workers to favour individual/family-based responsibilities of old age support.

(2) *Own job environment*: Besides the employment status, the survey has several questions with implications for the financial security of those employed. The respondents are asked: how many hours they worked in the previous week; whether they are employed by a large corporation; how many employees work in their corporation; how many years they have worked for it; whether they have a second job; if so, how many hours they worked in the previous week; whether they are a member of a labour union; and whether there is a chance of losing their job within one year.

(3) *Spouse job environment*: Personal finances of the spouse, if married, have strong implications for the financial security of the respondent. The survey asks about how many hours the spouse worked in the previous week and how many employees work in his or her corporation. To account for the financial security of a household associated with working for a large corporation, we construct an indicator that measures whether one or more household members are employed by a large corporation.

(4) *Budget situation*: The surveys ask about the income from the main job and the household's total income. The higher the income, the more financially secure, and hence the more inclined respondents will be towards an individual/family-based system. Information about the income dynamics of the household is based on a question that measures whether the household income situation has undergone any changes. There is also a variable capturing a forward-looking income evaluation, namely, whether the respondents expect their future pension entitlement to be better or worse than that of current recipients.

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[11] Full-time worker, part-time worker, dispatched from personnel agency, self-employed, family worker, piece worker, retiree, unemployed, and other not working.

Political orientation and party support: We argue that a person's general political beliefs will affect attitude towards old age support. The political position may of course also be influenced by the socio-demographic and economic factors potentially affecting attitude towards the livelihood of the elderly. However, in other studies on economic reform, it was found that political beliefs may constitute a separate influence from the current economic situation (Hayo, 2005). Our hypothesis is that the more people support left-wing political positions, the more inclined they will be towards implementing more government responsibility in the organisation of the social security system. Empirically, the political positions of respondents are measured by their ideological position on a left-right scale, their opinion concerning government redistribution policy, and their political party support.

Information indicator: How much people know about the current situation of the social security system should affect their opinions. Our conjecture is that the more they are informed, the less confident they will be about the public system, and therefore the greater the support for an individual/family-based system. As an indicator for information access we employ a variable that measures how often the respondent reads a newspaper.

Social ties: Family ties may have a significant independent effect. The more people feel tied to their family and value such ties, the more likely they will prefer privately-organised old age support. We proxy the degree of family ties by utilising three questions from the survey: how often the respondents have dinner together with their families, how much they are satisfied with their family life, and whether they favour the idea of three generations living together. An answer to the last question could also be a manifestation of the dominant norm of the society at the time of the respondent's socialisation and collinear to the cohort-effect element of age. However, this should not pose a serious problem, as both variables are imperfect indicators of socialization. In addition, we include an indicator for the level of general trust of respondents, as arguably trust is important for making work a pay-as-you-go social security system across generations and the provision of old-age care.

Health: The health situation is likely to affect people's opinion. Our conjecture is that the healthier they are, the less concerned they are about their livelihood in old age. The surveys ask about the respondents' health conditions – proxying for objective assessment of health - and how satisfied they are with their health condition – a subjective indicator. While in general the effect on our variables of interest is unclear, we expect that personal experiences with either private or public health care systems will have a substantial effect on the overall evaluation by the respondents.

Community size: People's opinions about public or private responsibilities with respect to livelihood and care of the elderly may depend on whether they live in more urban or rural areas. Those persons living in rural areas may tend to have more traditional views and values related to the family. In particular, family and personal relationships may play a larger

role in their lives independent of the personal experience of respondents within their own families being measured by the family tie indicators. Therefore, we expect that those living in the rural areas will be relatively more in favour of individual/family-based responsibility than urban dwellers.

Table 2 summarises information on the variables used in this analysis, showing the mean values, standard deviations, and correlation coefficients with the two variables of interest for each explanatory variable. Concentrating on correlations larger than 10%, we find in the case of the livelihood of the elderly that attitudes in favour of a government-organised pension system are negatively associated with age and the expected size of pension, while they are positively viewed by those respondents who support government income redistribution. The latter effect is also present in the case of care for the elderly, where those whose financial situation has improved over the last few years tend to support private care options.

Table 2: Summary statistics for data used in the analysis

Variable	Mean	SD	Correlation with livelihood of the elderly	Correlation with care of the elderly
Livelihood of elderly	3.34	1.16		0.67
Care of elderly	3.56	1.08	0.67	
Age effect:				
Age	51.8	16.8	-0.11**	-0.06**
Gender effect:				
Female	0.54	0.50	-0.02	-0.005
Marital status:				
Single	0.15	0.36	0.07**	0.02*
Married	0.74	0.44	-0.04**	-0.003
Separated/widowed	0.11	0.32	-0.03**	-0.02*
No. of children	1.73	1.18	-0.08**	-0.05**
Education:				
Mandatory school	0.24	0.42	-0.03**	-0.03**
Secondary education	0.46	0.50	0.02	0.02
Higher education (College)	0.29	0.45	0.01	-0.001
Higher education (Graduate school)	0.02	0.12	-0.002	0.001

Employment status				
Full-time employee	0.35	0.48	0.05**	0.03**
Part-time employee	0.13	0.34	0.04**	0.03**
Dispatched from personnel agency	0.30	0.16	0.05**	0.05**
Self-employed	0.08	0.28	-0.05**	-0.04**
Family worker	0.05	0.21	-0.03**	-0.02*
Piece worker	0.01	0.10	-0.005	0.01
Retirees	0.10	0.29	-0.02	-0.01
Unemployed	0.02	0.14	0.02	0.03**
Household	0.24	0.42	-0.03**	-0.01
Other not working	0.04	0.19	-0.01	-0.004
Own job environment				
Working hours	24.4	23.2	0.03**	0.005
Corporation size	2.08	3.29	0.08**	0.06**
Years of work	8.46	12.3	-0.04**	-0.03**
Second job	0.02	0.14	0.005	-0.01
Second job working hours	0.25	2.39	0.003	-0.01
Member of labour union	0.12	0.32	0.04**	0.02
High probability of job loss	1.43	0.72	0.06**	0.03**
Spouse job environment				
Spouse working hours	18.9	23.6	-0.01	-0.006
Spouse corporation size	2.29	3.22	0.02	0.02*
Anyone in the household employed by a large corporation	0.15	2.08	0.03**	0.02*
Budget situation				
Income main job	4.27	4.32	0.004	-0.003
Household income	9.69	3.01	-0.08**	-0.06**
Improvement in financial situation	1.59	0.60	-0.08**	-0.10**
Expected size of pension	1.69	0.87	-0.11**	-0.08**

Political orientation				
Left-right placement	2.88	0.91	0.08**	0.08**
Government responsible for reducing income inequality	3.65	1.05	0.17**	0.14**
Political party support				
Liberal Democratic Party	0.21	0.41	-0.09**	-0.09**
Democratic Party	0.05	0.22	0.01	0.02
New Komeito Party	0.03	0.17	0.01	0.02
Communist Party	0.02	0.12	0.03**	0.03**
Social Democrat Party	0.02	0.12	0.009	0.01
Other party	0.01	0.10	-0.03**	-0.02*
No party support	0.51	0.50	0.01	0.001
Information indicator				
Frequency of reading a newspaper	4.46	1.14	-0.06**	-0.02
Social ties				
General trust	2.10	0.57	0.03**	-0.01
Regular family dinner	5.92	1.68	-0.02	-0.01
Satisfied with family life	3.57	1.00	-0.08**	-0.06
Desirable for three generations to share a home	0.65	0.48	-0.04**	-0.05**
Health situation				
Health condition	3.44	1.16	-0.06**	-0.06**
Health satisfaction	3.36	1.10	-0.07**	-0.07**
Community size	1.97	0.65	0.03**	0.02*

Notes: The variable coding can be found in Table A1 in the Appendix. SD: standard deviation. ** (*) indicates significance at the 1% (5%) level.

4. Empirical Estimates Using Ordered Logit Models with Time-invariant Coefficients

The bivariate correlations in Table 2 do not take into account possible interactions between the various explanatory variables. Therefore, we conduct multivariate analysis. Given the ordered scale of the dependent variable, we employ ordered logit models (see Green 2002). Following the general-to-specific modelling strategy advocated by Hendry (1993), a consistent testing-down process is applied to this model. In the interpretation of the variables, we concentrate on the statistically significant effects of the variables that remain in

the equations after the testing-down process. While we report results based upon normal standard errors (SEs), it can be shown for all parts of the analysis that using heteroscedasticity-robust SEs (White 1980) does not affect our conclusions (results available upon request). In this section, we conduct the analysis under the assumption of time-invariant coefficients of the explanatory variables. The results of estimating the general models can be found in Table A2 in the Appendix. The pseudo R^2 values of the different models are about 4%, with the models explaining attitudes towards care of the elderly showing a slightly better fit. Applying the testing-down procedure on the full models yields the reduced models displayed in Table 3.

Table 3: Reduced models: Explaining responsibility for livelihood and care of the elderly

Variable	Livelihood of the elderly		Care of the elderly	
	Coefficient	SD	Coefficient	SD
Age effect:				
Age	-0.010**	0.002	0.020**	0.007
Age squared			-0.0002**	0.0007
Employment status				
Self-employed	-0.235**	0.066	-0.242**	0.067
Own job environment				
Corporation size	0.014*	0.006		
Spouse job environment				
Spouse working hours	-0.004**	0.001	-0.006**	0.001
Spouse corporation size	0.024**	0.008	0.026**	0.008
Budget situation				
Household income	-0.033**	0.007	-0.022**	0.007
Improvement in financial situation	-0.175**	0.031	-0.227**	0.031
Expected size of pension	-0.118**	0.029	-0.105**	0.029
Political orientation				
Left-right placement	0.077**	0.021	0.094**	0.022
Government responsible for reducing income inequality	0.318**	0.018	0.244**	0.018
Political party support				
Liberal Democratic Party	-0.182**	0.048	-0.251**	0.018
Communist Party			0.474**	0.159

Information indicator				
Frequency of reading a newspaper	-0.043**	0.016		
Social ties				
Satisfied with family life	-0.053**	0.020		
Desirable for three generations to share a home	-0.091*	0.038	-0.135**	0.038
Health situation				
Health satisfaction	-0.086**	0.018	-0.095	0.017
Time effects				
Year 2002	0.533**	0.046	0.764**	0.046
Year 2003	0.602**	0.054	0.765**	0.054
Year 2005	0.922**	0.055	1.177**	0.055
Cut values				
Cut value 1	-3.022	0.175	-2.575	0.223
Cut value 2	-1.800	0.172	-1.279	0.220
Cut value 3	-0.094	0.171	0.542	0.220
Cut value 4	1.198	0.172	2.047	0.221
No. of observations	10,387		10,390	
Log likelihood	-14,935		-14,199	
LR Test	$Chi^2(18) = 1189$**		$Chi^2(17) = 1220$**	
Pseudo R^2	0.038		0.041	
Testing-down restriction	$Chi^2(34) = 34.5$		$Chi^2(35) = 27.2$	

Notes: For coding information on variables see Table A1 in the Appendix. SD: standard deviation. * (**) indicates significance at a 5% (1%) level.

Livelihood of the elderly

Of the 56 variables in the general model, only 18 survive the testing-down process. The remaining variables of the model explaining attitudes towards the livelihood are discussed in turn. The table shows age has a significantly negative impact, implying that older people are more inclined towards a privately-supported livelihood of old age. This is in line with our cohort effect explanation: older people conform to the more conservative social norm of Japanese society of the past. However, the age variable may also have picked up the life-cycle effect, which, as we argue above, tends to push people in favour of the public option as they get older. Unfortunately, separating these two effects is not possible here, as we do not

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have a panel data set. However, it is worthwhile to get at least a rough understanding of the life-cycle effect; so we resort to temporal analysis of the aggregate cohort effect. We create synthetic age cohorts for 5-year periods and follow their average attitudes over our sample time to determine whether there is a trend in the cohort attitudes towards the livelihood of the elderly, Table 4 summarises the outcome of regressing these on a deterministic trend.[12]

Most of the cohorts show an increase in support for the government-based system as they age, in particular the younger cohorts up to 42 and those with people around retirement age. Thus, for most cohorts our conjecture on the aging effect is supported, although the short time span does not allow full confidence in the results. These findings suggest that the age variable is indeed a mixture of cohort and life-cycle effects and that the former dominates the latter throughout all ages in forming the opinion on livelihood of the elderly. [13]

Table 4: Time trends in attitudes towards the livelihood of the elderly over different cohorts

Cohort	18-22	23-27	28-32	33-37	38-42	43-47
Trend	↑	↔	↑	↑	↑	↔
Cohort	48-52	53-57	58-62	63-67	68-72	73-77
Trend	↔	↔	↑	↑	↔	↔

Note: ↑ (↔) indicates an upward trend (no trend) at a 20% significance level.

Self-employed respondents are supportive of an individual/family-based pension system. Under the current system, coverage for the self-employed, classified as Category I insured, is "thin" in that compared to company employees the premium they pay is low and so is their entitlement. In addition, while the spouses of company employees, Category III insured, do not need to contribute themselves in order to be entitled, those of self-employed do, which may be viewed as unfair. Further, the survivor's pension is only payable to a wife with children under 18 years old.

Corporate size has a positive effect on attitudes towards a government-based system. Following our conjecture above, this implies that the higher degree of financial stability of pension funds paid into by large corporation employees the greater the degree of trust in the public system. Additional financial stability is generated if the spouse works for a large

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[12] A constant term is also included in the regression but not reported here to conserve space.

[13] This is also in line with the aging effect interpretation based on a variant of hyperbolic discounting, which would reduce the incentive to gather information about important patterns of the pension system that are of relevance in the future only. There is a (weak) positive correlation between our information indicator (frequency of reading a newspaper) and age, which suggests that younger persons are relatively less informed (Pearson's correlation coefficient for age and expected size of pension is 0.13 for those who are not yet retired, which is significant at a 1% level). Based on our estimations, we would expect younger people to contribute more given their support for the government-based system. Empirically, this is not the case; the contribution rate is actually lower in the younger age groups (see Yuda (2006), for instance). Given that our data is a repeated cross-section and not a panel, we cannot separate the various effects with great precision.

corporation, as the pension funds that large corporation employees contribute to tend to be more stable than those of other groups of workers.

A slightly puzzling finding is the higher explanatory power of the spouses' working environment compared to the variables referring to the respondents themselves. In the case of working hours, our hypothesis is that this result is driven by female respondents. Long working hours are a proxy for future salary increases based on promotion of an employee. The gender asymmetry stems from the fact that the probability of promotion for men is higher than that for women.[14] To investigate this explanation, we create an additional variable that captures spouse working hours for female respondents. The new variable is now significant at a 1% level, while the general "spouse working hours" variable becomes insignificant.

The results for all the other explanatory variables are more or less in line with our prior expectations. The three personal finance variables – household income, the change in household financial situation, and the future expected pension entitlement – are in line with our priors. Those respondents whose households are relatively better off, who have improved their budget situation over time, and who expect higher future pensions, are more likely to support a privately-organised pension system.

The same conclusion holds for political and party orientation. Respondents, whose political ideology is more left-wing lean towards a government-based system. In addition, supporters of the Liberal Democratic Party, who tend to be conservative, are more prone to choose an individual/family-based pension system. The frequency of reading books, our indicator of information access, also has the expected impact. The more respondents read about the current situation of the public pension system the less they are inclined towards the government-based option. The more they are satisfied with their family life the more they prefer the idea of three generations living together. Moreover, the more they are satisfied with their health condition, the greater the likelihood of support for an individual/family-based pension system, which is in line with the hypotheses developed above. The negative effect of this variable can also be interpreted as a manifestation of the dominant norm of the society at the time of the respondent's socialization similar to the cohort-effect element of age. If such an interpretation is correct, it strengthens the cohort-effect element of age, because both variables show significant coefficients, at least at the 10% level.

Care of the elderly

In contrast to the results for livelihood of the elderly, we find a non-linear effect of age on care of the elderly as depicted in Figure 2:

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[14] According to the 2007 Basic Survey on Female Employment and Management (Table 12) only 6.9% of the management positions are filled by female employees.

Figure 2: Non-linear age effect in attitudes towards care for the elderly
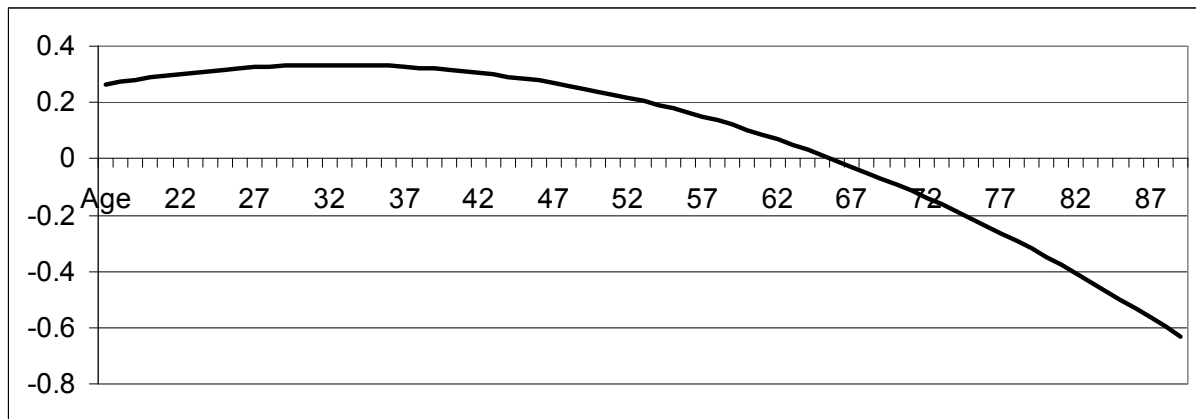
In Section 2, we conjecture that the cohort-effect element of the age variable likely pushes people towards the private/individual option, but its life-cycle effect element works in the opposite direction. To check whether our conjecture is correct, we generate synthetic cohorts again and follow their aggregate attitudes over our sample time. We obtain a similar result as that shown in Table 5, implying that aging indeed pushes people in favour of the public option. The results provided in Table 3 and Figure 2 can be interpreted as an indication that the relative strength of the life-cycle effect vis-à-vis the cohort effect differs across time. From a very young to mature age, support for a public social security system is dominant because people are at such a life-cycle stage that they may have to make substantial compromises in their personal life both personally and career-wise, to care for their parents. As people become older they may realise that they will need care for themselves in the not too distant future. They start preferring, perhaps due to a growing feeling of helplessness, to receive care given by their kin rather than anonymous social workers. Thus, over time the cohort effect becomes dominant. The net effect of these different effects related to age manifest as an inverted hyperbola. In fact, it is quite remarkable that the impact of age on support for public care becomes negative quite precisely at the age of retirement.

Table 5: Time trends in attitudes towards care of the elderly over different cohorts

Cohort	18-22	23-27	28-32	33-37	38-42	43-47
Trend	↑	↑	↑	↑	↑	↔
Cohort	48-52	53-57	58-62	63-67	68-72	73-77
Trend	↔	↔	↑	↑	↔	↔

Note: ↑ (↔) indicates an upward trend (no trend) at a 20% significance level.

Given that we find a preference toward a public system both in the outcome of the regression model as well as in the cohort analysis, we cannot be sure that the upward-

sloping part of the time pattern in Figure 2 is due to age as it may be driven by cohort effects. However, with regard to the more dominating time pattern of falling support for a public system with age, we get the result noted above for the livelihood of the elderly, namely, a likely underestimation of the negative impact of age in Table 3.

As in the case of livelihood, being self-employed exerts a positive influence on the choice of an individual/family-based care system. Self-employed people receive medical care from a different institution, National Health Insurance (NHI; *Kokumin Kenko Hoken*) than company and government employees. The financial situation of NHI is of great concern.[15] Various reform measures of the public health insurance system are mainly targeted to this segment of the system.[16]

Working hours and company size of the spouse are strongly significant; in fact, this time the same variables relating to the respondent themselves are insignificant. In the case of explaining the livelihood of the elderly, we were able to show the importance of gender effects. Repeating the test discussed above for care of the elderly is not as revealing. Other factors might also play a role.[17] To further investigate the issue, we study whether there is a life-cycle effect present, in combination with the gender impact discovered above. With age women tend to become more concerned about the work position of their husbands than men about their wives, many of whom may not be working anyway. Empirically, we test whether older women drive the significance of the spouse work variables. The interaction of age, female, and spouse working hours and company size, respectively, become significant, while the base spouse work variables become insignificant. We take this as evidence that it is indeed a combined life-cycle and gender effect that explains the importance of the spouse's working conditions in the determination of attitudes towards the organisation of old-age care.

The remaining explanatory variables show effects that are consistent with our theoretical priors. Household income, improvement in financial situation, expected size of pension, political view of left-right placement, supporter of the Liberal Democratic Party, desirability of three generations sharing a home and health satisfaction are significant explanatory variables and raise the likelihood of support for an individual/family-based care system.

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[15] According to the 2008 White Paper (Annual Reports in Health and Welfare) of the Ministry of Health, Labour and Welfare, the NHI is the only fund that has recorded a deficit (13.2 billion yen). The other two funds, government-managed and health insurance association-managed, recorded a surplus of 141.9 and 295.6 billion yen, respectively, in 2005. For more in-depth analysis, see Maeda (2006), for instance.

[16] In 2003, the government announced the Grand Programme for Medicare System Reform, emphasising the need to strengthen the financial situation of NHI as one of the four main objectives.

[17] One hypothesis we look at is impact of the (objective or subjective) state of health of the respondent, as a more precarious health situation may increase the importance of the spouse. We do not find convincing evidence for this hypothesis. Another hypothesis that we investigate is that the self-employed care for the financial security of their spouses, due to their own relatively high variability of income. Yet again the data does not support this argument.

What is not common is that being a supporter of the Communist Party has a significant negative effect on individual choice here. This may be due to the fact that the Communist Party has a stronger stance on the issue of health insurance reform than on pension reform.[18] On the other hand, the frequency of reading newspapers and family life satisfaction, which were on the list of influencing factors in explaining the attitude towards the livelihood of the elderly, are not significant here. Problems of care for the elderly are more intuitively understood than pension problems and, therefore, access to information is not as relevant. Whether people are in a "satisfactory" family relationship is not as influential in the case of care as in the livelihood context, which might be attributed to the more limited role a family can play in the case of disease and injury.

5. Time-variant Coefficient Models

An important assumption underlying the analysis so far is that coefficients are constant over time. The only way time can enter is via the year dummy variables. It is possible, however, that the time profile of answers to our variables of interest is affected by changes in the influence of certain variables during the sample period. In addition, the significance of the year dummies might be spurious as these may just pick up the variation over time of other coefficients. To assess the robustness of our analysis so far, we re-estimate the model allowing for full temporal parameter heterogeneity. To economise on space, in Table 6 we report the reduced model only (omitted results available upon request).

Table 6: Reduced model allowing for time-variant parameters: Explaining responsibility for livelihood and care of the elderly

	Livelihood of the elderly		Care of the elderly	
Variable	Coefficient	SD	Coefficient	SD
Age effect:				
Age	-0.010**	0.002	0.020**	0.007
Age in 2005			0.008**	0.002
Age squared			-0.0003**	0.0007
Employment status				
Self-employed	-0.232**	0.066	-0.423**	0.083
Self-employed in 2001			0.496**	0.161
Self-employed in 2005			0.475**	0.182

[18] For instance, the Japan Communist Party was running a strong campaign to organise opposition against the Koizumi social security reform of 2001-2002.

Own job environment				
Corporation size	0.015*	0.006		
Second job working hours in 2001	0.043**	0.016		
Spouse job environment				
Spouse working hours	-0.004**	0.001	-0.006**	0.001
Spouse corporation size	0.024**	0.008	0.026**	0.008
Budget situation				
Household income	-0.033**	0.007	-0.023**	0.007
Improvement in financial situation	-0.174**	0.031	-0.225**	0.031
Expected size of pension	-0.120**	0.029	-0.104**	0.029
Political orientation				
Left-right placement	0.071**	0.021	0.091**	0.022
Government responsible for reducing income inequality	0.232**	0.019	0.141**	0.019
Government responsible for reducing income inequality in 2002	0.143**	0.012	0.210**	0.012
Government responsible for reducing income inequality in 2003	0.158**	0.014	0.205**	0.014
Government responsible for reducing income inequality in 2005	0.242**	0.018	0.192**	0.035
Political party support				
Liberal Democratic Party	-0.180**	0.048	-0.266**	0.048
Communist Party			0.464**	0.159
Communist Party in 2001	1.023**	0.290		
Information indicator				
Frequency of reading a newspaper	-0.044**	0.017		

Social ties				
Satisfied with family life	-0.054**	0.020		
Desirable for three generations to share a home	-0.088*	0.038	-0.133**	0.038
Health situation				
Health satisfaction	-0.085**	0.018	-0.095**	0.017
Cut values				
Cut value 1	-3.366	0.174	-3.004	0.222
Cut value 2	-2.145	0.171	-1.708	0.219
Cut value 3	-0.440	0.170	0.111	0.218
Cut value 4	0.856	0.170	1.620	0.219
No. of observations	10,387		10,390	
Log likelihood	-14,923		-14,189	
LR Test	$Chi^2(20) = 1112$**		$Chi^2(20) = 1240$**	
Pseudo R^2	0.039		0.042	
Testing-down restriction	$Chi^2(210) = 229.5$		$Chi^2(212) = 237.5$	

Notes: For coding information on variables see Table A1 in the Appendix. SD: standard deviation. * (**) indicates significance at a 5% (1%) level.

It is important to note that the homogeneity assumption imposed in the previous analysis is justified in general. However, there are particular time-dependent effects that warrant attention.

Livelihood of the elderly

Starting with attitudes towards the livelihood of the elderly, we find a significantly positive coefficient on second job working hours in 2001. This implies that in this year, those respondents who worked a lot of hours in a second job are even more in favour of a government-based pension system than in the other years. This could be a reflection of the 1990's prolonged recession in Japan – people in recessionary times tending to favour greater government support. A similar conclusion holds for the supporters of the Communist Party, who by virtue of political principle, tend to favour government support.

Perhaps more interesting is the development of the effect of attitude towards government responsibility for reducing income inequality in the years 2002, 2003, and 2005. In each year, the coefficient increases, the coefficient in 2005 being significantly larger than

those in the previous years.[19] Note that the year dummies have not survived the testing-down process. This indicates that there is no general upward trend in attitudes towards a publicly-organised pension system as suggested by Figure 1, but rather a strengthening of belief in such a system by those respondents who regard the government as responsible for reducing income inequality.[20] Or, to put it differently, the measured increase in support of a government-based system can be explained by supporters of far-reaching state-intervention in the economy applying their core values more consistently to the field of social security.

One possible interpretation for this phenomenon is offered in the context of the structural reform policies rigorously pursued by the government during that time period. As soon as Prime Minister Junnichiro Koizumi came into power in 2001, at a time when Japan was still suffering from the prolonged recession, he and his Minister of Economic Affairs, Heizo Takenaka, introduced various deregulations and privatization programmes. While many attribute the macroeconomic recovery, which officially started in April 2003, to their market-oriented reform policies, Japanese society has substantially polarized to become what is nowadays known as the *Kakusa-shakai* ("gap society"). We argue that in the light of these developments, those who believe in a strong role of the government in the economy started to express their opinions much more clearly from around this time.

Care of the elderly

Moving to the model explaining care of the elderly in the right panel of Table 6, we find a similar outcome. The negative impact of age is reduced in 2005, so that the inverse U-shape influence shown in Figure 2 is changed. The effect is that the maximum can now be found at age 47 and the impact of age is no longer negative over a realistic human lifespan. Thus, in the last wave of the survey, the age of the respondent has a positive effect on support for a publicly-organised long-term care system. In 2004, Koizumi passed a law to increase the self-payment rate for the old (70+) from 20% to 30%. The additional age effect measured in 2005 could be a reaction to that, as respondents might interpret this new financial burden as a consequence of a market-oriented reform programme applied to the publicly-organised system instead of viewing it as a necessary step to ensure its financial liquidity. Comparing this situation of supposedly market-led re-structuring with the former times of generous coverage of health expenditures, respondents support a stronger role of the government to ward off these types of reform measures in the future. This interpretation is supported by the

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[19] Testing the coefficient on attitude towards government responsibility for reducing income inequality reveals that there is no significant difference between 2002 and 2003 ($Chi^2(1) = 0.8$), and the coefficient in 2005 is significantly larger than that in 2002 ($Chi^2(1) = 38.8$**) and that In 2003 ($Chi^2(1) = 24$**) (** indicating significance difference at the 1% level).

[20] Note that the average attitude of the Japanese population with regard to a greater role of the government in redistribution has not changed very much over the years (minimum: 3.57 in 2002, maximum: 3.75 in 2005).

data as it can be shown that it is the younger generation (below 30 years) rather than older whose support for the public system increased notably in 2005.[21] This may be more likely an expression of protest against the introduction of changes to the existing system rather than the outcome of experiencing direct economic disadvantages because of these changes.

The negative effect of self-employment is no longer significantly different from zero in 2001 and 2005.[22] As in the livelihood regression, the impact of the attitude towards government responsibility for reducing income inequality on support for government-organised care for the elderly varies over the years 2002, 2003, and 2005. While the year dummies become insignificant, there is no statistical difference between the coefficients for these three years.[23] Hence, yet again, it is the increase in the coherency of the beliefs of the state-intervention supporters that explains the rising level of government-organised care for the elderly. The argument relating to the Koizumi structural reform programme applies here as well.

6. Computing Marginal Effects

The interpretation of coefficients of ordered logit models is not straightforward and does not allow an easy comparison of the relative strength of effects of the included variables. In addition, the coefficients of ordered logit models can be misleading with regard to the effects of changes in the explanatory variables on the predicted probabilities of falling under one of the categories of the dependent variable (Greene 1991, 703ff). In particular, the estimated coefficients do not imply sign restrictions on the effects of changes in the explanatory variables on the middle categories. It is therefore useful to compute marginal effects of explanatory variables, here evaluated at the sample mean of the other variables. For dummy variables, this is not truly a marginal effect but rather the change from zero to one. Note that the predicted frequencies of the estimated models in Tables 5 and 6 are fairly close to the actual frequencies even in the extreme categories, which indicates a good fit of the models.

Livelihood of the elderly

In Table 5, we show the marginal effects for the reduced models explaining the livelihood of the elderly with the help of time-variant coefficients (Table 6). For reasons of brevity, the estimates for the marginal effects of the time-dependent variables have been omitted (available upon request).

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[21] Pearson's correlation coefficient between age and support for a publicly-based care system for the elderly is 0.13 for respondents below 30 years and -0.004 for those who are 65 and above.
[22] Testing the coefficient of the base effect of self-employment against the coefficients associated with 2001 ($Chi^2(1) = 0.3$) and 2005 ($Chi^2(1) = 0.1$) reveals non-significance.
[23] The outcome of the restriction tests is: coefficient of 2002 against 2003: $Chi^2(1) = 0.1$; coefficient of 2003 against 2005: $Chi^2(1) = 0.3$; coefficient of 2002 against 2005: $Chi^2(1) = 0.1$.

Table 7: Reduced model livelihood of the elderly: Marginal effects of ordered logit regressions from Table 6

Livelihood of the elderly	Individual / family	↔	↔ both ↔	↔	Government
Age	0.0006**	0.001**	0.001**	-0.001**	-0.002**
Self-employed	0.015**	0.023**	0.018**	-0.025**	-0.031**
Corporation size	-0.001*	-0.001*	-0.001*	0.001*	0.002*
Spouse working hours	0.0003**	0.0004**	0.0004**	-0.0005**	-0.0006**
Spouse corporation size	-0.002**	-0.002**	-0.002**	0.002**	0.003**
Household income	0.002**	0.003**	0.003**	-0.003**	-0.005**
Improvement in financial situation	0.011**	0.016**	0.016**	-0.018**	-0.025**
Expected size of pension	0.007**	0.011**	0.011**	-0.012**	-0.017**
Left-right placement	-0.004**	-0.007**	-0.006**	0.007**	0.010**
Government responsible for reducing income inequality	-0.014**	-0.022**	-0.021**	0.024**	0.033**
Liberal Democratic Party	0.011**	0.017**	0.015**	-0.019**	-0.025**
Frequency of reading a newspaper	0.003**	0.004**	0.004**	-0.004**	-0.006**
Satisfied with family life	0.003**	0.005**	0.005**	-0.006**	-0.008**
Desirable for three generations to share a home	0.005**	0.008*	0.008*	-0.009**	-0.013*
Health satisfaction	0.005**	0.008**	0.008**	-0.009**	-0.012**
Frequency in % (actual / predicted)	0.08 / 0.07	0.13 / 0.13	0.35 / 0.38	0.25 / 0.26	0.19 / 0.17

Notes: For coding information on variables see Table A1 in the Appendix. * (**) indicates significance at a 5% (1%) level.

The probability that the respondents opt in favour of an individual/family-based pension system increases by approximately 0.06 percentage points every year of life, while the probability of being in favour of government responsibility decreases by about 0.2 percentage points. This means that in Japan, holding all other variables at their mean values or zero, a person of 50 years old will be about 3 percentage points more likely to opt for full private responsibility of livelihood than an 18-year-old.

If a respondent becomes self-employed, the model predicts that the probability of support for a government-based pension system falls by about 3 percentage points, which is similar to an age difference of 30 years, while the probability that he will favour an individual/family-based pension system rises by 1.5 percentage points.

Regarding corporation size, we find relatively small impact of differences between different company sizes. For instance, a person moving from a small firm (2-4 employees) to a medium-sized firm of about 1,000 employees will experience an increase in preference for a government-based pension system by somewhat less than 1.5 percentage points.

If the spouse's working hours double starting from an average of 20 hours, the probability of supporting the private pension system falls by about 1.2 percentage points, while support for a government-based pension system increases by 0.6 percentage points. The spouse's average corporation size is slightly larger than for the respondents themselves, which to a certain extent compensates for the larger marginal coefficients.

Doubling the annual household income from the average of about 5.5 million yen decreases the likelihood of choosing the government-based pension system by about 2 percentage points. For example, the rather unlikely move from the bottom income bracket up to the top yields a probability change of 9 percentage points. Considering the budget dynamics, if a household moves from the situation of a worsening budget compared to the previous year to an improvement, the probability of supporting a government-based option goes down by 5 percentage points.

A jump from the average of a "somewhat worse" expectation about the future pension payments to a "somewhat better" expectation lowers support for a government-based pension system by about 3.5 percentage points. While this effect is fairly large, there are only few respondents in our sample that actually have this type of positive expectation.

If a person moves from being a full conservative towards being a full liberal, his support for a government-based pension system will fall by 4 percentage points. This indicates that realistic ideological changes will have modest effects only. Supporting the Liberal Democratic Party will raise (lower) the probability of supporting a private (public) pension system by about 1 (2.5) percentage point(s). The relatively strongest effect of all factors in explaining attitudes on organising a system ensuring the livelihood for the elderly is connected to the stance on the responsibility of government when it comes to re-distribution. If someone

moves from denying any role of government towards full responsibility, then his probability of supporting the publicly-organised pension system increases by more than 13 percentage points.

The effect of information is not particularly large. Assuming a person who never looks at a newspaper becomes a daily reader, his probability of supporting the government-based system will decline by about 2.5 percentage points. Slightly larger is the impact of satisfaction with family life. If the assessment with family life rises from totally dissatisfied to fully satisfied, support for the public pension system goes down by about 3 percentage points. Larger is the full change in opinion about the issue of three generations living under one roof. Here a move from total opposition to full embracement yields a lowering of probability for supporting a government-based pension system by over 5 percentage points. Of a similar magnitude is the comparable improvement of a person's subjective health situation.

Care of the elderly

Table 8 contains the results for the marginal effects for the ordered logit model explaining attitudes towards organising care of the elderly estimated in Table 6. Most of the marginal effects are similar to those discussed in the previous section.

Table 8: Reduced model care of the elderly: Marginal effects of ordered logit regressions from Table 6

Care of the elderly	Individual / family	↔	↔ both ↔	↔	Government
Age	-0.0007**	-0.001**	-0.003**	0.002**	0.003**
Age squared	0.00001**	0.00002**	0.00004**	-0.00002**	-0.00004**
Self-employed	0.018**	0.034**	0.053**	-0.044**	-0.062**
Spouse working hours	0.0002**	0.0004**	0.001**	-0.0005**	-0.001**
Spouse corporation size	-0.001**	-0.002**	-0.004**	0.002**	0.004**
Household income	0.001**	0.002**	0.003**	-0.002**	-0.004**
Improvement in financial situation	0.008**	0.016**	0.032**	-0.020**	-0.037**
Expected size of pension	0.004**	0.008**	0.015**	-0.009**	-0.017**
Left-right placement	-0.003**	-0.007**	-0.013**	0.008**	0.015**

Government responsible for reducing income inequality	-0.005**	-0.010**	-0.020**	0.012**	0.023**
Liberal Democratic Party	0.010**	0.020**	0.036**	-0.025**	-0.041**
Communist Party	-0.014**	-0.029**	-0.069**	0.026**	0.085**
Desirable for three generations to share a home	0.005**	0.010**	0.019**	-0.011**	-0.022**
Health satisfaction	0.003**	0.007**	0.013**	-0.008**	-0.015**
Frequency in % (actual / predicted)	0.04 / 0.04	0.10 / 0.09	0.33 / 0.34	0.31 / 0.33	0.22 / 0.20

Notes: For coding information on variables see Table A1 in the Appendix. * (**) indicates significance at a 5% (1%) level.

Noteworthy differences relate to the following variables: Starting with age, a person of 50 years old will be about 1 percentage points more likely to opt for government responsibility of a social security system than an 18-year-old. This effect stands in contrast to the one on livelihood above but is still not particularly large. In contrast, the impact of self-employment is about twice as large in the case of old-age care. Here the probability of support for a government-based system falls by about 6 percentage points if a respondent becomes self-employed. If a household moves from the situation of a worsening budget situation to an improvement, the probability of choosing a government-based option goes down by almost 7.5 percentage points. Relatively strong is the effect of political ideology. Support for a government-based pension system will fall by 6 percentage points if a person moves from being a full conservative towards being a full liberal.

Relatively larger is the drop in probability of choosing a public care system related to becoming a Liberal Democratic Party supporter, which is now 4 percentage points. Yet being a supporter of the Communist Party raises the likelihood of preferring a government-based social security system by the large margin of 8.5 percentage points. However, a relatively smaller effect is to be found in the influence of attitudes towards government re-distribution, where a complete reversal of opinion raises the likelihood of opting for the public system by 9 percentage points only. This is still an important effect but clearly smaller compared to the livelihood case: Larger than in the case of the livelihood of the elderly is the impact of the variables measuring attitudes towards three generations living under one roof. Here, support for the public social security system falls by almost 9 percentage points.

Thus, comparing the marginal effects across our two dependent variables, we find that political factors play the most dominant role, followed by level and change of household income. All other effects are of relatively smaller importance.

7. Conclusion

This study aimed to tackle a largely unexplored field of opinion formation on the degree of government involvement in ensuring the livelihood and care of the elderly. Using individual-level data from the Japanese General Social Survey (JGSS), a nationwide representative survey data, the investigation attempted to identify which of various factors of the respondents, namely, socio-demographic (such as age or level of education), economic (such as personal income or employment status), political (such as support for a political party or attitudes towards the role of government in redistribution), and social variables (such as opinion on three generations living together or satisfaction with family life), help to explain attitudes towards organisation of the pension, and health and long-term care systems.

Given that the responses are ordered qualitative choices on a scale of 1 to 5 and ranging from the choice of individual/family responsibility to government/public responsibility, we estimated the effects of the explanatory variables selected based on priors and availability in ordered logit models. The consistent testing-down procedure eliminated many of the variables thought to affect the choice of opinion.

Many of the remaining variables are common in both the livelihood and care estimations: age, self-employed status, spouse work environment, budget situation, political orientation, political party support, desirability for three generations sharing a home, and health satisfaction. These effects are qualitatively the same for both livelihood and care, except for age. Age inclines the respondents toward the individual/family option for livelihood but towards the government/public choice for care. The former can be explained by the cohort effect dominating the life-cycle effect, reflecting older people's more conservative values. The latter arguably reflects life-cycle effects in that people prefer the public option at a working age, when the burden of caring for their old relatives is the greatest, but become inclined more towards the individual option as they approach their own retirement.

Among the variables that are common between the two dependent variables, the most noteworthy is that spouse job environment exerts a relatively strong influence. We found that gender effects can offer a plausible interpretation. The pronounced effect of the self-employed can be understood by the fact that they belong to a different pension institution than that of company and government employees, which is financially weaker.

The results of all the other common variables are in line with our prior expectations. Government-based social security systems are preferred by persons leaning toward the political left, favouring government redistribution, supporting the Communist Party, and

whose spouse works for a large corporation. Respondents characterised by self-employment, high income, positive income development, a large expected size of pension, Liberal Democratic Party support, satisfaction with their health situation, a greater degree of information, satisfaction with family life, preference for several generations living under on roof are more in favour of individual/family-based social security systems.

These estimation results also show a significant, positive coefficient of the year intercept dummies. To further investigate this and to assess the robustness of our analysis, we re-estimate the model allowing for full temporal parameter heterogeneity. We find an increase in support of a government-based pension and health and long-term care systems over time, which can be explained by supporters of far-reaching state-intervention in the economy applying their core values more consistently to the field of social security. In the years under study, Prime Minister Koizumi's government (2001-2006) rigorously implemented market-oriented reforms, which allegedly polarised Japanese society. We argue that in the light of these developments, those, who believe in a strong role of the government in the economy, started to express their opinions with regard to social security issues much more clearly.

In this study, we encounter a typical finding in microeconomic studies, namely, that the explanatory power of the models is limited. Thus, even allowing for the fact that the pseudo R^2 used in the context of ordered logit models cannot be interpreted in a straightforward way as the percentage of the explained variance of the dependent variable, there is little doubt that attitude formation is much more complex than we assume in our typical economic models. Having said so, we strongly believe that this line of research will benefit from advancement of the theoretical background, which is lacking at present.

A separation of general and idiosyncratic effects of personal characteristics on attitudes towards the organisation of the pension, and health and long-term care systems could be achieved by extending the analysis to other aging societies. The availability of panel data – both at an individual and aggregate level – would make it possible to investigate some of the effects more thoroughly, for instance, the influence of aging versus cohorts or the impact of macroeconomic shocks on attitudes towards the organisation of social security systems.

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Appendix

Table A1: Coding of variables

Variable	Coding
Age	min: 20, max: 89
No. of children	min: 0 max: 10
Working hours	min: 0, max: 105
Corporation size	0: N.A.; 1: 1 employee; 2: 2-4, 3: 5-9; 4: 10-29; 5: 30-99; 6: 100-299; 7: 300-499; 8: 500-999, 9: 1,000-1,999, 10: 2,000-9,999, 11: >10,000 employees & government employees; DK = mean
Years of work	min: 0, max: 70
Second job working hours	min: 0, max: 70
Spouse working hours	min: 0, max: 133
Spouse corporation size	0: N.A.; 1: 1 employee; 2: 2-4, 3: 5-9; 4: 10-29; 5: 30-99; 6: 100-299; 7: 300-499; 8: 500-999, 9: 1,000-1,999, 10: 2,000-9,999, 11: >10,000 employees & government employees; DK = mean
High probability of job loss	1: not at all likely; 2: not too likely; 3: fairly likely; 4: very likely
Income main job	0: no job income, 1: none; 2: < 700,000 yen per annum; 3: 700,000-1 million; 4: 1-1.3 million; 5: 1.3-1.5 million; 6: 1.5-2.5 million; 7: 2.5-3.5 million; 8: 3.5-4.5 million; 9: 4.5-5.5 million; 10: 5.5-6.5 million; 11: 6.5-7.5 million; 12: 7.5-8.5 million; 13: 8.5-10 million; 14: 10-12 million; 15: 12-14 million; 16: 14-16 million; 17: 16-18.5 million; 18: 18.5-23 million; 19: > 23 million yen per annum
Household income	1: none; 2: < 700,000 yen per annum; 3: 700,000-1 million; 4: 1-1.3 million; 5: 1.3-1.5 million; 6: 1.5-2.5 million; 7: 2.5-3.5 million; 8: 3.5-4.5 million; 9: 4.5-5.5 million; 10: 5.5-6.5 million; 11: 6.5-7.5 million; 12: 7.5-8.5 million; 13: 8.5-10 million; 14: 10-12 million; 15: 12-14 million; 16: 14-16 million; 17: 16-18.5 million; 18: 18.5-23 million; 19: > 23 million yen per annum
Improvement in financial situation	Change in financial situation during last few years: 1: worse; 2: constant; 3: better

Expected size of pension	Pension better than what is paid now? 1: much worse; 2: somewhat worse; 3: about the same; 4: somewhat better; 5: much better
Left-right placement	1: conservative; ← 2, 3, 4, → 5: progressive
Government responsible for reducing income inequality	1: disagree; 2: somewhat disagree; 3: neither agree nor disagree; 4: somewhat agree; 5: agree
Frequency of reading news-paper	1: never; 2: less than once a week; 3: about once a week; 4: several times a week; 5: almost every day
General trust	1: no trust; 2: depends; 3: yes
Regular family dinner	1: never; 2: about once a year; 3: several times a year; 4: About once a month; 5: About once a week; 6: Several times a week; 7: Almost every day
Satisfied with family life	1: dissatisfied; ← 2, 3, 4, → 5: satisfied
Health condition	1: dissatisfied; ← 2, 3, 4, → 5: satisfied
Health satisfaction	1: dissatisfied; ← 2, 3, 4, → 5: satisfied
Community size	1: town/village; 2: other cities; 3: largest cities

Note: All other variables are coded as 0/1-dummies.

Table A2: Full models: Explaining responsibility for livelihood and care of the elderly

Variable	Livelihood of the elderly		Care of the elderly	
	Coefficient	SD	Coefficient	SD
Age effect:				
Age	-0.002	0.008	0.021*	0.008
Age squared	-0.0001	0.0001	-0.0003**	0.00001
Gender effect:				
Female	-0.034	0.052	0.012	0.053
Marital status:				
Single	-0.025	0.084	-0.077	0.084
Married	Reference			
Separated/widowed	-0.015	0.070	-0.043	0.070
No. of children	-0.033	0.020	-0.044*	0.021
Education:				
Mandatory school	Reference			
Secondary education	-0.086	0.051	-0.056	0.051
Higher education (College)	-0.115	0.060	-0.097	0.061
Higher education (Graduate school)	-0.067	0.157	-0.006	0.157
Employment status				
Full-time employee	Reference			
Part-time employee	-0.028	0.074	0.018	0.074
Dispatched from personnel agency	-0.124	0.119	-0.136	0.122
Self-employed	-0.244**	0.076	-0.185*	0.077
Family worker	-0.080	0.099	-0.104	0.099
Piece worker	-0.243	0.188	-0.071	0.186
Retirees	0.038	0.127	-0.042	0.128
Unemployed	-0.085	0.160	0.039	0.160
Household	-0.028	0.107	-0.055	0.108
Other not working	-0.001	0.140	0.040	0.141

Own job environment				
Working hours	0.001	0.002	-0.002	0.002
Corporation size	0.014	0.008	0.007	0.008
Years of work	-0.001	0.002	-0.003	0.002
Second job	0.011	0.188	-0.222	0.192
Second job working hours	0.002	0.011	0.004	0.011
Member of labour union	0.055	0.064	0.054	0.065
High probability of job loss	0.051	0.029	0.011	0.030
Spouse job environment				
Spouse working hours	-0.004**	0.001	-0.005**	0.001
Spouse corporation size	0.027**	0.010	0.031**	0.011
Budget situation				
Income main job	-0.009	0.010	0.009	0.010
Household income	-0.028**	0.008	-0.019*	0.008
Improvement in financial situation	-0.165**	0.032	-0.224**	0.032
Expected size of pension	-0.118**	0.030	-0.107**	0.030
Political orientation				
Left-right placement	0.069**	0.021	0.095**	0.022
Government responsible for reducing income inequality	0.313**	0.018	0.240**	0.018
Political party support				
Liberal Democratic Party	-0.164**	0.049	-0.239**	0.050
Democratic Party	-0.004	0.082	-0.050	0.082
New Komeito Party	0.070	0.112	0.080	0.111
Communist Party	0.365	0.160	0.458**	0.160
Social Democrat Party	0.110	0.145	0.042	0.144
Other party	-0.131	0.179	-0.096	0.181
No party support		Reference		
Information indicator				
Frequency of reading a newspaper	-0.046**	0.017	-0.005	0.017

Social ties				
General trust	-0.018	0.032	0.014	0.033
Regular family dinner	0.006	0.012	-0.004	0.012
Satisfied with family life	-0.052*	0.021	-0.027	0.021
Desirable for three generations to share a home	-0.091*	0.038	-0.129**	0.038
Health situation				
Health condition	-0.035	0.026	-0.033	0.027
Health satisfaction	-0.051	0.029	-0.054	0.029
Community size	0.056*	0.028	0.034	0.029
Time effects				
Year 2000		Reference		
Year 2001	-0.013	0.052	0.024	0.053
Year 2002	0.534**	0.052	0.781**	0.053
Year 2003	0.616**	0.061	0.780**	0.061
Year 2005	0.956**	0.065	1.230**	0.065
Cut values				
Cut value 1	-2.842	0.300	-2.656	0.304
Cut value 2	-1.619	0.299	-1.359	0.302
Cut value 3	0.090	0.298	0.466	0.301
Cut value 4	1.386	0.299	1.974	0.302
No. of observations	10,387		10,390	
Log likelihood	-14,917		-14,186	
LR Test	$Chi^2(52) = 1223$**		$Chi^2(52) = 1247$**	
Pseudo R^2	0.039		0.042	

Notes: For coding information on variables see Table A1 in the Appendix. SD: standard deviation. * (**) indicates significance at a 5% (1%) level.