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**Working Paper**

## Comparing public attitudes towards providing for the livelihood of the elderly in two aging societies: Germany and Japan

Marburger Volkswirtschaftliche Beiträge, No. 2007,03

**Provided in Cooperation with:**

Faculty of Business Administration and Economics, University of Marburg

*Suggested Citation:* Hayo, Bernd; Ono, Hiroyuki (2007) : Comparing public attitudes towards providing for the livelihood of the elderly in two aging societies: Germany and Japan, Marburger Volkswirtschaftliche Beiträge, No. 2007,03, Philipps-Universität Marburg, Fachbereich Wirtschaftswissenschaften, Marburg

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**Bernd Hayo and Hiroyuki Ono**

**Comparing Public Attitudes  
Towards Providing for the Livelihood  
of the Elderly in Two Aging Societies:  
Germany and Japan**

**No. 03-2007**

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# Comparing Public Attitudes Towards Providing for the Livelihood of the Elderly in Two Aging Societies: Germany and Japan

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## Abstract

This paper studies attitudes about who should provide for the livelihood of the elderly in two aging societies, namely Germany and Japan. Applying an ordered logit model to individual data from representative public opinion surveys, it is analysed which socio-demographic, economic or political variables help to explain people's attitudes on whether the government or individuals should be responsible for the livelihood of the elderly. We find that while higher income makes people more inclined towards the individual option, age is found to do the opposite in both countries. We conjecture that this age effect is related to the level of knowledge about the current situation of the public pension system. We also find that the part-time work status significantly affects attitudes in both countries, but not the same way. It affects adversely the inclination towards a government-based pension system in the case of Japan but positively in Germany. Other significant influences are the pensioner status of the respondents in Japan and their political position in the case of German data.

**JEL:** H55, Z10

**Keywords:** Livelihood of elderly, pension reform, public attitudes, aging societies, Germany, Japan

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We thank Barbara Hanel, Guido Heineck, Kaori Saito and participants of a workshop at Toyo University in September 2006 for helpful comments on earlier versions of the paper. The usual disclaimer applies.

## 1. Introduction

One of the urgent structural problems that Germany and Japan have in common is reforming their social security systems. Both countries are experiencing a rapid aging of the society, which threatens to eventually make their social insurance systems unsustainable. However, similar to the situation in other countries, structural reforms are politically sensitive. One important aspect is that politicians in particular appear to be quite reluctant to address these problems using appropriate approaches. This is arguably the case because those who are adversely affected in the reforms are perceived to be better organized politically than those who are not. Since politicians tend to be short-term oriented in democracies and pension reform is a long-term issue, necessary adjustments are sluggish. Usually social security “reforms” are implemented that alleviate short-term financial pressures but do not prevent another crisis a few years later.

For an analysis of this situation from a political economy perspective it is useful to identify who would be for or against such policies *objectively*, as well as who would be affected how *subjectively*. In social security reforms, there is a large volume of economic research on the first theme. We would argue that this is not sufficient because in a situation of limited information and bounded rationality people may not recognize and accept such “objective” benefits, and oppose even those policies that benefit them due to misperceptions. Research on the second theme would be significant in that it, first, identifies where such a “perception gap” exists and, second, which segments of the society the policymakers should target when formulating the reform strategies. If politicians can be more certain that they will not be punished in the next election for having introduced changes in the social security system they are more likely to behave in a socially optimal way.

The aim of this paper is to compare the *subjective* attitudes towards the livelihood of the elderly in Germany and Japan. It is studied which individual characteristics explain these attitudes, using representative public opinion data that only recently were made available to a wider group of researchers. Although the livelihood of the elderly relates to various institutions of social security, we think that the pension system is the most relevant, and thus forms the basis of our discussion. Contrasting the actual empirical results with a priori hypotheses based on a general notion of individual intertemporal utility maximisation yields interesting insights about which groups in these societies *perceive* to be better off under a pension system dominated by government or individuals, respectively.

Many issues that are of relevance to the topic of pension reform, in particular related to the welfare state, have been discussed in very different contexts; for example, re-distributional

aspects are studied by Corneo and Grüner (2002), intergenerational conflicts by Hamil-Luker (2001), and differing preferences of populations in Europe and the US by Alesina et al. (2004). However, there are relatively few studies on the specific question of public attitudes towards organising the pension system, most of which are quite recent. Boeri et al. (2001, 2002) look at attitudes towards pension reform in France, Germany, Italy and Spain. Evans and Kelly (2004) investigate public opinion on this issue in Australia and compare results with samples from Finland and Poland. For the Netherlands, van Els (2003) et al. provide empirical evidence. Using data from the *International Social Survey Programs (ISSP), Role of Government III*, Kikuzawa (2005) compares attitudes on questions related to the government responsibility for providing for the livelihood of the elderly for various countries, including Germany and Japan. She finds a somewhat higher support in Germany than in Japan with regard to a stronger individual responsibility for the livelihood of the elderly.

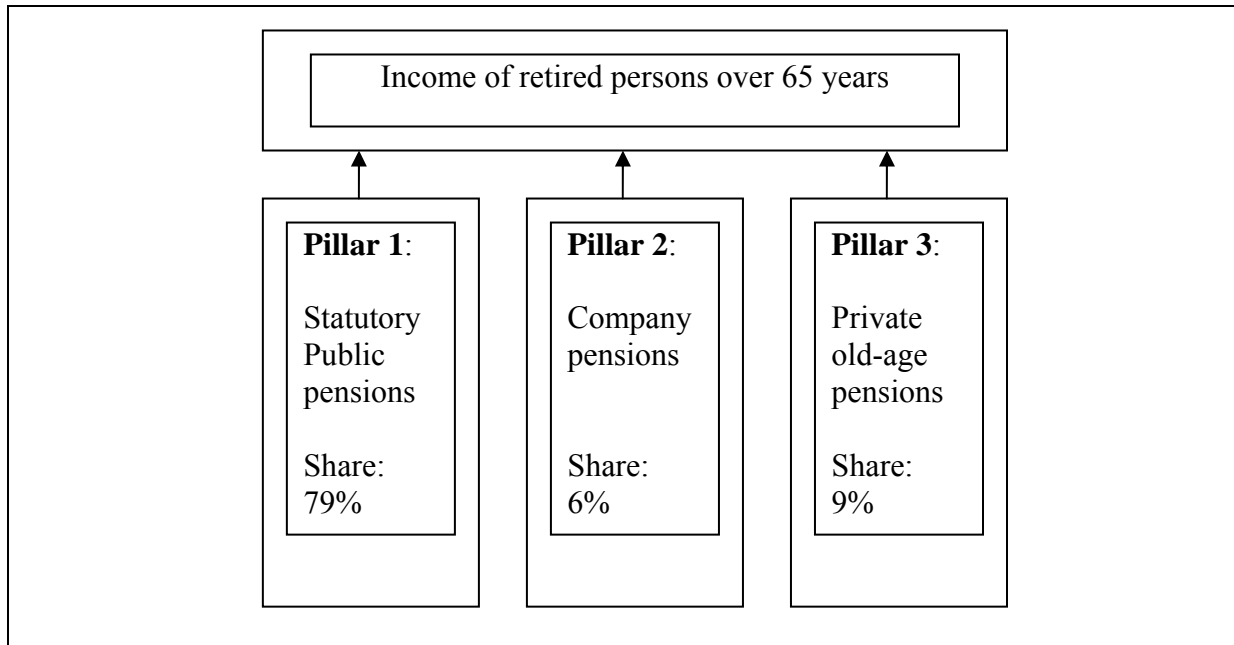
In the next section, we provide a brief overview of the pension systems in the two countries. The third section discusses the data base and some methodological issues. Various hypotheses that are put to the test are presented in the fourth section. Sections five and six report the estimation results and the interpretations thereof. The final, seventh section summarises and concludes the paper.

## **2. Institutional Overview**

Since we give a particular focus on the pension system in considering the livelihood of the elderly, a brief overlook of the public system in Germany and Japan is in order.

The **German pension system** is based on three pillars. The statutory public pension system is by far the most important pillar by providing on average more than three quarters of old age incomes (see Figure 1). The other two pillars are company-based pension systems and individual pension plans. Most employees have to pay a certain percentage of their wage into the public pension system, while most professionals, independent businessmen, and firm-owners can choose to opt out. Civil servants receive their pensions out of the general budget of the authorities (federal level or state level) they are working for. The public pension pillar is primarily a pay-as-you-go system, i.e. the current working population pays for the current generation of retirees. The actual size of the individual pension is computed using a relatively complicated formula based, among other things, upon the number of years of a person's working life and the amount of money he contributed.

Figure 1: Overview of the German pension system



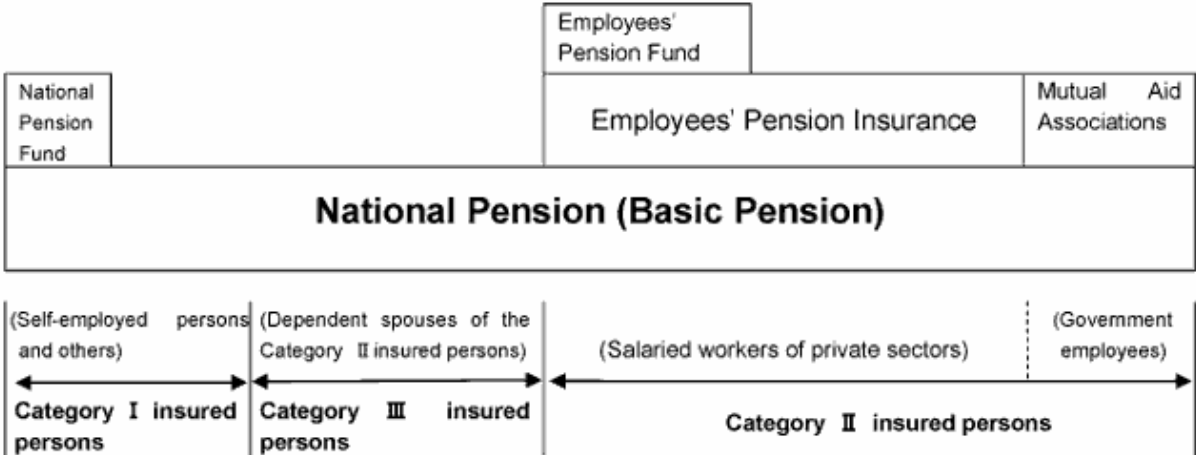
Source: German Federal Ministry of Labour and Social Affairs. 6 % of incomes come from sources other than the three pillars.

In general, pensions grow in line with average wages in the economy. Any gap between pension contributions and obligations is being covered by the general federal budget. To strengthen the funded part of the German pension system, the government subsidises certain company-based and individual-based pension plans since 2002.

In the case of the **Japanese public pension system**, there are, at least, three important characteristics worth mentioning. The most salient one is its so-called two-storied system (see Figure 2). Everyone belongs to the common “first floor” or the *Basic Pension*, which provides them with the same level of entitlements, regardless of the premium they have paid up to the starting age. The “second floor” differs from person to person, based on their job categories. For instance, salaried workers of private sectors and government employees (collectively, *category-II insured*) belong to, respectively, their employees’ pension insurance and mutual aid associations, which entitle them with the benefits based on their income before the retirement. These two are compulsory. However, self-employed and non-working spouses of the *category-II insured* (*category-I insured* and *category-III insured*, respectively) do not have such “second-floor” coverage as compulsory, and *can choose* to join the National Pension Fund if so desired. The second characteristic of the Japanese public pension is that, although it is run as a funded system in principle, it is *de facto* a pay-as-you-go system. In 2003, the system ran a deficit, with revenues of 3,614 billion yen and expenditures of 3,664 billion yen (Ministry of Health, Labour, and Welfare (2003), p. 37). The third characteristic is that even

though it was designed as an insurance institution, it is partially financed by tax. More specifically, one third of the revenue for the Basic Pension is tax. So, there are many ambivalences in the system.

Figure 2: Overview of the Japanese pension system



Source: Social Insurance Agency Homepage

Comparing Germany and Japan with respect to pension coverage, note that in the former country there is no basic pension that encompasses all retirees. Instead retirees that would fall below a generally defined minimum standard of living (Existenzminimum) receive, out of the local public welfare funds, an allowance and possibly in-kind transfers from the government to ensure their livelihood, such as housing, health care, and subsidies for durable consumer goods. As a study by the Cabinet Office of Japan (2002) shows, these design differences translate themselves into a relatively lower average share of retirees that receive a public pension under the German system.

**3. Data base and methodology**

The data base in the case of Japan is the Japanese General Social Survey (JGSS), which is the first of its kind in this country and draws many questions from the US General Social Survey.<sup>1</sup> It is a nationwide representative survey collected using a two-stage stratified random

<sup>1</sup> The Japanese General Social Surveys (JGSS) are designed and carried out at the Institute of Regional Studies at Osaka University of Commerce in collaboration with the Institute of Social Science at the University of Tokyo under the direction of Ichiro TANIOKA, Michio NITTA, Hiroki SATO and Noriko IWAI with Project Manager, Minae OSAWA. The project is financially assisted by Gakujutsu Frontier Grant from the Japanese Ministry of Education, Culture, Sports, Science and Technology for 1999-2003 academic years, and the datasets are compiled with cooperation from the SSJ Data Archive, Information Center for Social Science Research on Japan, Institute of Social Science, the University of Tokyo.

sampling process, with stratification based on population (20 - 89 years), region and by population of size of cities/districts. In the present study we use JGSS 2003, which was sampled in November 2003.<sup>2</sup>

In the following, our dependent variable for *Japan* is based on the question:

“Who do you think should be responsible for the livelihood of the elderly?”

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

For Germany, we employ survey data from the project “Deutschland vor der demographischen Herausforderung” (Germany facing the demographic challenge) initiated by the Bundesverband deutscher Banken (Association of German Banks) and conducted by IPOS Mannheim. The data were collected by telephone interviews over the time period 23 August to 2 September 2004 and are representative for the population from 18 years onwards.<sup>3</sup> The dependent variable in this case is:

“In your opinion, who should be responsible for the provision of old age?”

Answer categories: 1. Primarily individuals, 2. both to the same extent, 3. Government

Note that for the dependent variables in both countries, Germany and Japan, answers are coded in such a way that higher numbers indicate greater support for a government responsibility for the livelihood of elderly. Table 1 presents a summary of the respective frequencies for the answer categories.

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

	Individuals	↔	↔ both ↔	↔	Government
Japan	7%	11%	31%	26%	25%
Germany	17%	n.a.	71%	n.a.	12%

Note: No of observations: Japan: 1940, Germany: 1509.

These figures indicate that in Germany a majority of people opt for a mixed system to finance the livelihood of the elderly, with 5 percent preferring individual responsibility over social responsibility. Given that the scale is different, the comparison depends on how we allocate

<sup>2</sup> For a detailed description of this survey see Iwai (2004). Our version of the data set was obtained from the Zentralarchiv für Empirische Sozialforschung at the University of Cologne (Study no. ZA4200).

<sup>3</sup> The data are available from the Zentralarchiv für Empirische Sozialforschung at the University of Cologne (Study no. ZA4058).



the share of the two additional categories in the Japanese data. If we assume that respondents would have opted for the middle category given a three-point scale, the Japanese would also prefer a mixed system. In contrast to the Germans, they would be relatively more in favour of government provision with an 18 percent lead. However, if we allocate the two additional middle categories in Japan to the extremes, we even find a majority of Japanese supporting a government-based provision of old age. Independent from any issues arising from the allocation of the answers to these additional categories, the Japanese are less favourable with regard to leaving the livelihood of their elderly in the hands of individuals than the Germans are. This is consistent with the results reported by Kikuzawa (2005), using a different data set. In the actual empirical analyses in Section 4, we want to investigate whether attitudes to this question can be explained using socio-demographic, economic, and political variables. Table 2 summarises information on the variables used in this analysis for both Germany and Japan.

Table 2: Summary statistics for data used in ordered logit model

Variables	Germany			Japan		
	Mean	St. Dev.	Correlation	Mean	St. Dev.	Correlation
Government provision for old age	1.94	0.53	1	3.51	1.19	1
Age effect:						
Age	45.35	15.45	-0.003	53.28	15.54	-0.11
Age squared	2295	1508	0.002	3075	1627	-0.11
Gender effect:						
Female	0.51	0.50	0.07	0.52	0.50	0.03
Marital status:						
Single	0.30	0.46	-0.01	0.10	0.31	0.03
Married	0.53	0.50	-0.007	0.79	0.41	-0.04
Separated/widowed	0.17	0.37	0.02	0.11	0.31	0.02
No of children	0.66	0.48	0.04	1.81	1.13	-0.08
Education:						
Primary school	0.29	0.45	0.06	0.04	0.19	0.02
Secondary school	0.34	0.47	-0.02	0.24	0.43	-0.02
A-level/High school	0.16	0.36	-0.01	0.44	0.50	0.01
College/University	0.22	0.41	-0.04	0.29	0.45	0.001
Employment status						

Full-time employee	0.50	0.50	-0.10	0.43	0.50	0.01
Part-time employee	0.12	0.33	0.08	0.18	0.39	-0.06
Retirees	0.17	0.37	0.03	0.11	0.31	0.03
Unemployed	0.05	0.21	0.07	0.02	0.14	0.04
Household	0.06	0.24	0.07	0.23	0.42	-0.003
In education	0.06	0.24	-0.004	0.003	0.06	0.02
Other	0.02	0.12	-0.03			
Absolute income	0.02	0.99	-0.14	5.659	3.771	-0.07
Income quartiles						
Lowest quartile	0.24	0.43	0.09	0.22	0.41	0.05
Lower-middle quartile	0.26	0.44	0.08	0.24	0.43	0.02
Upper-middle quartile	0.25	0.43	-0.06	0.26	0.44	-0.02
Highest quartile	0.26	0.44	-0.11	0.28	0.45	-0.05
Political orientation						
CDU/CSU	0.38	0.49	-0.07		n.a.	
SPD	0.21	0.41	0.02		n.a.	
Green Party	0.11	0.31	-0.06		n.a.	
PDS	0.07	0.25	0.15		n.a.	
Other parties	0.05	0.22	-0.01		n.a.	
No voting	0.19	0.39	0.02		n.a.	
Left-right placement		n.a.		2.91	0.92	0.06
Community size:						
Village/town	0.30	0.46	0.0003	0.23	0.42	-0.04
Cities	0.44	0.50	0.02	0.58	0.49	0.01
Largest cities	0.26	0.44	-0.02	0.19	0.39	0.03

*Notes:*

*Japan:* No of observations: 1245. Absolute income in Million Yen based on 19 intervals. Education categories are based on the following years of schooling: Primary: 6, Secondary: 9, High school: 12, College/University: 16+.

*Germany:* no of observations: 1155. Absolute income is based on factor scores and varies between -3.6 and 1.7. Education categories are based on the following years of schooling: Primary: 9, Secondary: 10, High school: 12/13, College/University: 16+. Town/village is coded between 0 and 5000 inhabitants, other cities between 10000 and 100000, and big cities greater than 100000.

The choice of variables is based on theoretical considerations outlined in the next section and, of course, subject to constraints coming from the data base. For each country, the table

provides mean values, standard deviations and the correlations with the dependent variable measuring attitudes towards responsibility for livelihood of the elderly. Except for the dependent variable, age, absolute income and number of children all variables are coded as dummies. This allows the interpretation of the mean as a share of a particular category in the sample, e.g. the share of female respondents is 51% in Germany and 52% in Japan.

The German survey does not include a direct question on income. To overcome this limitation, we compute an indicator for income based on the score values generated by a factor analysis using 10 variables that tend to be associated with income. In particular, the factor analysis includes information on (factor loadings in brackets): whether the household saves money (0.52), receives a pension (-0.58), is still in education (0.56), is fully employed (0.64), is unemployed (-0.28), is widowed (-0.47), rates his economic situation as bad (-0.46), is happy (0.38), is a blue-collar worker (-0.34), and is a white-collar worker (0.30). The Eigenvector takes on a value of 2.2 and it explains 22% of the common variance. While the explained variance is not particularly high, all of the variables exhibit the theoretically expected signs, which we interpret as indicating the reliability of our indicator.<sup>4</sup>

In Table 2, concentrating on correlations larger than 10% between the dependent and the other variables indicates that in the case of Germany full-time employees, absolutely and relatively richer respondents are more in favour of individual responsibility of providing for the elderly, while supporters of the left-wing party PDS tend to support government responsibility. In the case of Japan, the only correlation larger than 10% is related to older people expressing a preference for individual responsibility.

However, these bivariate correlations do not take into account possible interactions between the various explanatory variables, which we will address in the multivariate analysis below. Since the dependent variable is of an ordered scale, it would be inappropriate to apply ordinary least squares estimators. Instead, we use ordered logit models (see Green 1991). The full model contains all common explanatory variables in the surveys on both countries. Following the general-to-specific modelling strategy advocated by Hendry (1993), a consistent testing-down process has been applied to this model. We employ normal standard errors (SE) in the analysis but it can be shown that using heteroscedasticity-robust standard errors based on White (1980) does not lead to noticeable differences. In the interpretation of the variables, we generally concentrate on the statistically significant effects of the variables that remain after the testing-down process.

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<sup>4</sup> We have also constructed an alternative indicator using 5 variables only (factor loadings in brackets): whether the household saves money (0.43), receives a pension (-0.79), is still in education (0.49), is fully employed (0.71), is widowed (-0.64). The Eigenvector takes on a value of 1.96 and it explains 39% of the common variance. The regression results using this alternative indicator were very similar.

#### **4. Theoretical hypotheses**

In the following, we discuss a variety of theoretical relationships between individual characteristics and attitudes towards responsibility for the livelihood of the elderly. We concentrate on those effects that we can operationalise empirically given our data base. Moreover, the focus is on relationships on a *ceteris paribus* basis, at least for those effects we can control for, using one or more of the other covariates.

*Age:* We would conjecture that age will be one of the most important variables affecting attitudes, as these attitudes are likely going to change over the life-cycle. Assuming non-fully rational agents or hyperbolic discounting, in an early age, very few would ever think of their livelihood when old. Over time, after moving through childhood and adolescence into adulthood, more certain attitude about who should support them after retirement will be formed. In particular, entering the labour market, and thereby paying taxes and social insurance premia, will make people more aware of this issue. Whether this has a noteworthy impact on the attitude towards our question of interest is not clear. Our preliminary hypothesis based on assuming rational actors is that the older the people get, the more inclined they become towards the public support option. One reason is that they have already paid a large amount of contributions to the public system and would want to “collect them back” in the form of the benefits. A related reason is that, once they started to be supported by the public system, it would be almost impossible to switch to an individual- or family-based system as an alternative for the government-based system even if it is cut back.

*Gender:* Men and women may develop different attitudes and opinions towards the livelihood of their old age. Before becoming of old age, men work, earn, and possibly save more for their old age than females. On the other hand, women spend more time with their children, if any, and develop greater bonds with them. They 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 cannot rely on family support when old. They can only resort to their private funds or depend upon the public system. Thus, from this insurance point of view, our hypothesis is that married persons will be relatively more in favour of individual-based systems than singles.

*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 greater the insurance effect resulting from more choices in the means of sustaining their old age life. Thus, our hypothesis is that

they rather oppose the public support option of paying higher contributions and receiving higher benefits.

*Education:* More educated people know better where and how their taxes and contributions are used than those who are not. Because of that, they tend to view the public system more critically. More educated persons may be more likely to think about their life from an intertemporal perspective and more aware of the economic life-cycle, while less educated people may naively expect more support from a public system. Therefore, our hypothesis is that educated people will prefer a more individualistic system.

*Employment status:* Employment directly affects a person's financial security. If people do not have jobs and thus no market income, they have less means to support their life now *and* in the old age. Germany has a particular problem with long-term unemployment, which implies that having no job this year raises the likelihood of being unemployed next year. Japan has seen a tremendous increase in non-regular workers (including part-time workers) that are estimated to make up about 30% of total workers in 2004 and 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 – 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 attitude may develop. Full-time employees tend to have greater financial security than part-time workers and those out of employment. It is especially true in Japan, because the well-known “life-long employment” of salaried workers in large businesses is still a widely practiced norm. Thus, our hypotheses are that the unemployed will be most strongly in favour of government responsibility, followed by part-time workers. Contrary to that, we expect full-time workers to be rather in favour of individual-based responsibilities of old age support.

*Absolute and relative income:* The more income people earn, the more financially independent and secure they become. Arguably, greater financial independence and security would make people lean towards the individual option, because they have fewer choices in and control over the public support system than the individual/private ones they may choose in the financial markets. In other words, the compulsory public system would lower their personal welfare. A related argument can be made with respect to relative income. Being relatively more affluent does not generate more choices in the same way that absolute income does. However, we know from the socio-economic literature on life-satisfaction that people often think in terms of relative quantities instead of absolute ones (see, e.g. Frey and Stutzer 2002). In the current context, absolute and relative incomes are likely going to have a very similar impact on the attitudes towards the pension system. Thus, we put forward the

hypothesis that absolutely and/or relatively richer people will show more support for an individual-based systems.

*Political orientation:* We would expect that a person’s general political beliefs will affect his 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 issues, it was found that political beliefs may constitute a separate influence from, say, 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.

*Community size:* People’s opinions about the public or individual responsibilities with respect to the livelihood of the elderly may depend on whether they live in more urban or rural areas. Those persons living in rural areas tend to have more traditional views and values related to the family. In particular, the family and personal relationships play a larger role, which leads us to the hypothesis that those living in the urban areas will be relatively more in favour of individual responsibility than urban dwellers.

## 5. Empirical estimates for Germany and Japan

After developing our theoretical hypotheses in the previous section, we will now test them for each country with the help of ordered logit models, the results of which can be found in Table 3.

Table 3: Full Models: Explaining responsibility for livelihood for the elderly

Variables	Germany		Japan	
	Coefficients	St. Dev.	Coefficients	St. Dev.
Age effect:				
Age	-0.037	0.035	0.039	0.025
Age squared	0.0002	0.0004	-0.001*	.0003
Gender effect:				
Female	0.168	0.152	-0.007	0.133

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Marital status:				
Married			Reference	
Single	0.063	0.224	-0.314	0.220
Separated/widowed	-0.044	0.208	-0.212	0.151
No of children	0.103	0.205	-0.077	0.055
Education:				
Primary school			Reference	
Secondary school	-0.165	0.195	-0.495	0.313
A-level/High school	-0.010	0.256	-0.688*	0.337
College/University	0.108	0.254	-0.828*	0.349
Employment status				
Full-time employee			Reference	
Part-time employee	0.483(*)	0.255	-0.212	0.151
Retirees	0.008	0.323	0.531*	0.212
Household	0.452	0.337	0.065	0.172
Unemployed	-0.002	0.385	0.430	0.413
In education	-0.495	0.381	0.394	0.788
Other	-0.874	0.566	0.334	0.374
Absolute income	-0.237	0.223	-0.014	0.029
Income quartiles				
Lowest quartile			Reference	
Lower-middle quartile	0.024	0.303	-0.156	0.177
Upper-middle quartile	-0.383	0.413	-0.410(*)	0.217
Highest quartile	-0.449	0.529	-0.452	0.305
Political orientation				
CDU/CSU			Reference	
SPD	0.278	0.184		n.a.
Green Party	-0.188	0.231		n.a.
PDS	1.52**	0.294		n.a.
Other parties	-0.074	0.316		n.a.
No voting	0.077	0.198		n.a.
Left-right placement		n.a.	-0.452	0.305

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Community size:				
Town/village		Reference		
Cities	0.125	0.164	0.109	0.132
Largest cities	-0.055	0.210	0.216	0.171
Regional dummies	15 regional dummies included	5 regional dummies included		
Cut values				
Cut value 1	-2.692	0.926	-3.415	0.694
Cut value 2	1.292	0.923	-2.234	0.689
Cut value 3	n.a.		-0.797	0.687
Cut value 4	n.a.		0.401	0.686
No of observations	1155	1245		
Log likelihood	-852.6	-1831.1		
LR Test	Chi <sup>2</sup> (41) = 95.7**	Chi <sup>2</sup> (27) = 66.7**		
Pseudo-R <sup>2</sup>	0.05	0.02		

*Notes:* (\*), \*, \*\* indicate significance at a 10%, 5% and 1% level respectively. Regional dummies: Germany (reference category: Nordrhein-Westfalen): Schleswig-Holstein, Hamburg, Niedersachsen, Bremen, Hessen, Rheinland-Pfalz, Saarland, Baden-Württemberg, Bayern, Berlin, Brandenburg, Mecklenburg-Vorpommern, Sachsen-Anhalt, Thüringen, and Sachsen. Japan (reference category: Kanto): Hokkaido, Chubu, Kinki, Cyugoku, and Kyusyu. For other information see notes to Table 2.

The pseudo-R<sup>2</sup> values of the different models vary between 2% and 5%, which is quite small in absolute terms. The regression on Japan in particular indicates little explanatory power. However, the fit of the regressions is not necessarily worse than in other comparable areas of microeconometrics, e.g. in the analyses of labour markets or life satisfaction.

Applying the testing down procedure on the full models yields the reduced models displayed in Table 4. There is strong collinearity between age and its squared value as well as between the indicators for absolute income and income quartiles. Drawing on Occam's razor, we keep the linear relationship between age and the dependent variable and eliminate the non-linear term. The test statistics in the removal test is slightly more favourable when keeping the income quartiles and thus we delete absolute income. Thus, while the removal decisions affecting these variables are somewhat arbitrary the specific choice of the surviving variables has little influence on the effects of the other explanatory variables.



Table 4: Reduced Models: Explaining responsibility for livelihood for the elderly

Variables	Germany		Japan	
	Coefficients	St. Dev.	Coefficients	St. Dev.
Age effect:				
Age	-0.010*	0.005	-0.019**	0.004
Employment status				
Full-time employee			Reference	
Part-time employee	0.553**	0.205	-0.219(*)	0.127
Retirees			0.376(*)	0.207
Income quartiles				
Lowest quartile			Reference	
Upper-middle quartile	-0.708**	0.170	-0.325*	0.136
Highest quartile	-0.823**	0.170	-0.392**	0.121
Political orientation				
CDU/CSU			Reference	
PDS	1.45**	0.257	n.a.	
Regional dummies				
	Removed		Removed	
Cut values				
Cut value 1	-2.356**	0.263	-3.855**	0.253
Cut value 2	1.531**	0.251	-2.690**	0.242
Cut value 3	n.a.		-1.280**	0.231
Cut value 4	n.a.		-0.099	0.227
<hr/>				
No of observations	1155		1245	
Log likelihood	-867.7		-1847.0	
LR Test	Chi <sup>2</sup> (5) = 65.7**		Chi <sup>2</sup> (5) = 34.9**	
Pseudo-R <sup>2</sup>	0.04		0.01	
Testing down restriction	Chi <sup>2</sup> (36) = 29.7		Chi <sup>2</sup> (22) = 27.8	

Notes: See notes to Tables 2 and 3.

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. In Table 5, we give marginal effects for the reduced models in Table 3.

Table 5: Reduced model: Marginal effects of ordered logit regressions from Table 4

	Individuals	↔	↔ both ↔	↔	Government
<b>Germany</b>					
Age	0.0014*	n.a.	-0.0005*	n.a.	-0.0009*
Employment status: Part-time employee	-0.064**	n.a.	0.006	n.a.	0.058*
Income quartile: Upper-middle	0.107**	n.a.	-0.052**	n.a.	-0.055**
Income quartile: Highest	0.125**	n.a.	-0.063**	n.a.	-0.063**
Political orientation: PDS	-0.126**	n.a.	-0.081*	n.a.	0.206**
Frequency in % (actual / predicted)	0.17 / 0.16	n.a.	0.72 / 0.74	n.a.	0.11 / 0.10
<b>Japan</b>					
Age	0.001**	0.002**	0.002**	-0.001**	-0.004**
Employment status: Part-time employee	0.014	0.020	0.020(*)	-0.015	-0.040(*)
Employment status: Retiree	-0.020*	-0.031*	-0.041(*)	0.017**	0.075(*)
Income quartile: Upper-middle	0.021*	0.030*	0.030**	-0.023*	-0.058*
Income quartile: Highest	0.026**	0.036**	0.036**	-0.028**	-0.070**
Frequency in % (actual / predicted)	0.07 / 0.07	0.12 / 0.12	0.29 / 0.30	0.27 / 0.27	0.25 / 0.25

Notes: See notes to Tables 2, 3 and 4.

To ensure that the test results are not biased due to heteroscedasticity, we also compute robust standard errors based on White (1980). It turns out that all of the conclusions hold up.

In the case of Japan, the use of the income variables leads to a loss of over 500 observations due to missing data. While the sample size is still large enough for the application of powerful statistical tests, it may be possible that the non-reporting behaviour is not randomly distributed across respondents. In this case, we may have a selection bias and the data used in the above regression analysis may no longer be interpreted as a representative sample of the Japanese population as a whole. In Table 6, we compare the frequencies of attitudes towards the livelihood of the elderly with the ones in the full sample.

Table 6: Japan: Answer frequencies of responsibility for livelihood of the elderly

No. of observations	Individuals	↔	↔ both ↔	↔	Government
1940	7%	11%	31%	26%	25%
1245	7%	12%	29%	27%	25%

It is apparent that the differences are minor and primarily related to the middle categories. In terms of the personal characteristics of the respondents listed in Table 2, most frequencies are in a range of plus/minus 1 percentage point compared to the representative full sample. The only noteworthy differences are that the smaller sample contains fewer females (4 percentage points), more married persons (4 percentage points), less single persons (5 percentage points), more with a high school background (2 percentage points), more full-time employees (3 percentage points), and more retirees (2 percentage points). Thus, the structure of probands in the two samples looks rather similar.

However, due to the scale of the missing value problem in the case of Japan and possible biases resulting from the constructed income variable in the case of Germany, it seems prudent to investigate what the outcome of the analyses will be when excluding the income variables.<sup>5</sup> When evaluating the differences between the regressions including and excluding indicators for income, we do not believe that the problems related with the inclusion of the income variable lead to severely biased estimates, as those variables that turn out to be relevant when excluding income are strongly correlated with income. Again, these conclusions are robust to the assumption of heteroscedastic errors.

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<sup>5</sup> The estimation results were omitted to economise on space but they are available upon request.

## 6. Interpreting the results of the analysis

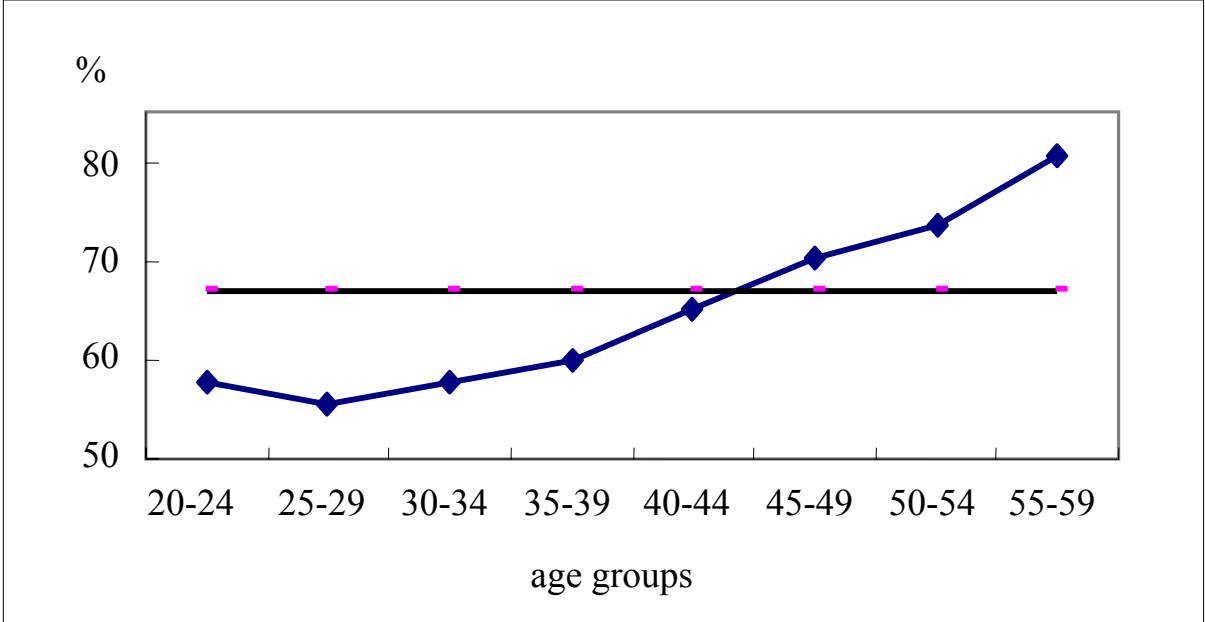
In the next step we interpret the empirical results from the previous section in light of our theoretical priors. Of the nine hypotheses formulated in Section 4, only few survive the empirical tests in the previous section. Two hypotheses appear to receive significant statistical support in both Germany and Japan. As can be seen from Table 4, those persons who are older are more in favour of individual responsibility of providing for the elderly. In the case of Germany, the probability that the respondents opt in favour of private responsibility increases by approximately 0.14 percentage points every life-year, while the probability of being in favour of government responsibility decreases by about 0.1 percentage points (see Table 5). In the case of Japan, the latter effect is stronger, with a loss of 0.4 percentage points. This means that in Germany, holding all other variables at their mean values or zero, a person that is 60 years old will be 4 percentage points more likely to opt for full individual responsibility than a 20 year old. In Japan, the likelihood that a 60 year old person will favour full government responsibility will be 16 percentage points lower than of a 20 year old one. This drop in support for government responsibility is distributed not only to the extreme category of private responsibility but rather equally across the range from a mixed system to full individual responsibility.

Thus, while our theoretical prior suggested a positive relation between age and government-based system, we rather find the opposite. This somewhat puzzling result may be explained in a bounded rational agent framework by the level of knowledge about the actual situation of the pension system by the respective age groups. Younger people are more in favour of the government-based system because they underestimate the true costs of pension contributions as they pay, at least on average, lower premia. *That is*, they may mistakenly compare the low premium now with the actual pension that older people get, instead of making the calculation over the lifetime, which would result in a higher premium and therefore a less beneficial relation of contributions to actual pension payments. An additional explanation would be 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.

This lack of knowledge and the interest thereof may manifest themselves in the contribution rate by the age group. Figure 3 shows the case of Japan. The contribution rate increases with the group age. One would expect that younger people contribute to the government-based system more as they support more, but that is not the case. The only possible explanation is that younger people are more apathetic, thus less informed of the actual situation, and thus mistakenly overestimate the benefits of the government-based pension system. We would say

that this is particularly true for the very young, as the retirement is still very far away. Only 57% of those in their 20s contribute, in contrast to over 80% in the group between 55 and 59.<sup>6</sup>

Figure 3: Contribution to public pension system across age groups



Source: Japanese Social Security Agency

The second influence that we measure for both countries is that respondents in the two upper income quartiles position prefer a pension system that is oriented more towards individual responsibility (see Table 4). Due to the strong collinearity between income quartiles and absolute income we cannot be sure whether this is an absolute or a relative income effect. The data suggest that the relative income effect is somewhat more pronounced but these differences are not statistically significant. If a person in Germany moves into the highest income quartile then the average probability of choosing full individual responsibility for the livelihood of the elderly increases by about 13 percentage points, while the probabilities of supporting a mixed and government-based system decrease by more than 6 percentage points each (see Table 5)). These values are slightly lower when entering the second-highest income quartile, namely 11 and more than 5 percentage points each.

In the case of Japan, these changes are more moderate. Entering the highest income quartile increases the likelihood of choosing a fully individual-based system by almost 4 percentage points, while it lowers the probability of supporting a fully government-based system by 7 percentage points. Combining the two extreme categories of the dependent variable for individual- and government-based responsibility respectively, we find a drop in support for

<sup>6</sup> For the non-contribution of the young age group, see Yuda (2006), for instance.

the latter system by about 10 percentage points and an increase of support for a privately-dominated system by 6 percentage points only, while the middle-category receive a 4 percentage points higher probability. Again as in the case of Germany, joining the upper-middle income category generates very similar effects that are quantitatively slightly smaller. To get an idea about the absolute money effects involved, we use the results from a regression based on substituting income quartiles by absolute annual income in million yen (estimation results omitted but available upon request). The probability of supporting a primarily government based pension system falls by more than 1.1 percentage point for a respondent at mean income who receives a raise in his annual income by one million yen (approximately 6800 euros). At the same time, the probability of choosing a primarily private-based system increases by 0.7 percentage points. Correspondingly, the support for a mixed system goes up by 0.4 percentage points.

Apart from age and income, the part-time employment status also significantly influences the livelihood of the elderly in both samples. However, in this case we find the direction of influence is substantially different across the two countries. While in Germany respondents that are part-time employees are significantly more in favour of government-based responsibility, we obtain the opposite result for Japan. The result for Germany is in line with our theoretical prior: people take into account that being responsible for themselves when old and/or for the livelihood of old-age family members depends to a large extent on their personal resources. In a government-based system they can expect more re-distribution to occur based on the principle of social equity.

A possible explanation for the surprising result in the case of Japan may be related to the coverage and entrance procedure of the Japanese social insurance system. If the work time of part-time workers exceeds three quarters of the work time of their full-time colleagues in the workplaces, their social security contributions are automatically collected by deducting it from the salaries, just like it is done for full-time workers. However, those who work less time are not automatically covered by the social security system in such a way. To enter into the system, they would need to file in an application form and undertake the necessary steps to pay the premium. This procedure may be perceived as quite tedious and may constitute a barrier to the system for this dominant group of part-time workers. Given this situation, they may form an opinion that they can be better off by not entering into the system at all. Moreover, based on the present value of paying the insurance premia versus investing the money in other assets or using it to boost current consumption, e.g. due to hyperbolic discounting, may be utility enhancing.

Regarding the effects of working part-time on the probabilities of supporting government responsibilities in ensuring the livelihood of the elderly, we find for Germany an increase by about 6 percentage points and a drop of preferences for individual-oriented responsibility by approximately the same amount. For Japan the likelihood of opting for full individual responsibility rises by more than 1 percentage points, while it drops for full government responsibility by 4 percentage points. Note, however, that only two of these marginal effects are statistically significant at a 10% level, and thus we should interpret these numbers with even greater caution.

Finally, in addition to the factors age, income, and the part-time work status, other factors are identified as a source of significant influences, one for each of the two countries, the employment status in Japan and the political view in Germany (see Table 4). In Japan, persons retiring are more likely to support a more government-based system by about 9% percentage points (see Table 5). They are less likely to opt for primarily private responsibility and a mixed system by about 5 and 4 percentage points respectively. Apparently, pensioners find it preferable not to depend on individual or family support in terms of provision for their living; once you have started your life after retirement with pension incomes, it would be very hard to switch to the one without it. In Germany, those who support the PDS (Partei des Demokratischen Sozialismus), a left-wing party that grew out of the Communist party of the former German Democratic Republic, are more in favour of government responsibility. This is in line with our theoretical expectations, as this party has a strong focus on the primacy of the government in the organisation of the state and in particular of the social security system. Those who vote for the PDS have a 21 percentage point higher probability of supporting a government based pension system, while support for an individually organised system or a mixed system drops by 13 and 8 percentage points respectively (see Table 5).

## **6. Conclusion**

Using the representative opinion surveys' individual data sets, this study has examined which socio-demographic, economic or political characteristics explain people's attitudes on whether the state or individuals should be responsible for the livelihood of the elderly in two aging societies, Germany and Japan. Using an ordered logit model, a few significant factors are identified out of several possible hypotheses. First, it is found that age and income exert the same influence for both countries; whereas higher income makes people more inclined towards the individual option, age is found to do the opposite in both countries. The former

result is in line with our theoretical prior, but we find the latter counter-intuitive and conjecture that it is related to the level of knowledge about the current situation of the public pension system. We also find that part-time work status significantly affects the choice in both countries, but not in the same way. It surprisingly affects adversely the inclination towards the government option in Japan but not in Germany. We relate the Japanese result to its complicated contributing procedures applicable to the part-time workers. We also identified the pensioner status for Japan and the political position for Germany as significant sources of influence.

As the paper concludes, we would like to put the present study back in the broader perspective of public pension reform. First, it appears to be the case that agents' attitudes towards pension reform are strongly influenced by the existing system in their respective countries. This suggests that securing public support for pension reform must take into account the existing system fully. This need not imply, however, that substantial changes in a country are impossible, but rather that the government is more likely to garner public support if the new system is communicated in a way that allows people to place this new system in the context of the previous one.

Second, it seems to be the case that people do not use straightforward utility maximisation when voicing their attitudes on pension reform. Thus, it may not be a successful strategy to increase public support by compensating those voters who are likely to lose from the pension reform, as these agents either do not understand the effects of adjusting the pension system or have a more socio-tropic view of economic reforms. An alternative strategy, therefore, could be to provide more information on the powerful forces of demographic change and the limitations of the existing pay-as-you-go systems under these circumstances. In this strategy, one ought to be open with regard to the distributional consequences of changes in the pension system. At the same time, policy makers should point out that a capital-based system is not advantageous under all circumstances and that there is no need to fully abolish the established pay-as-you-go system.

Third, 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<sup>2</sup> 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. For our question of interest, we would interpret this as evidence that, at least so far, no clear consensus on pension reform has emerged among those individuals who belong to one or



more particular groups of people that may face similar consequences from an evolving social security system.

Some promising lines of further research that are outside the scope of the present study are the following. Here we only use one year of data. However, people's attitudes change over time, and their opinions regarding the government role for providing the livelihood of the elderly is no exception. It is of interest to conduct the same analysis with (alternative) data from different years. We picked Germany and Japan as two examples of aging societies and found both similarities and differences in the comparison. Extending the analysis to other aging societies would help to separate general and idiosyncratic effects of personal characteristics on attitudes towards the organisation of the pension system and thereby could also shed additional light on the results obtained in the present study. Finally, should it be possible to collect enough observations on countries to form a cross-section or panel, we could even try to find out whether macroeconomic shocks affect attitudes on how to organize the pension system.

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