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Trust in government and its effect on preferences for income redistribution and perceived tax burden

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Abstract This paper explores how trust in government shared by neighbors is associated with individual preferences for income redistribution and individual perceptions regarding income tax burden. Using individual-level data from Japan, a nation with shared homogenous racial and cultural backgrounds, this paper controls for unobservable heterogeneity among Japan's population, thus reducing estimation bias. Three measures for trust in government are used: "trust in ministries and government agencies", "trust in diet members", and "trust in members of municipal councils". After controlling for individual characteristics, the key findings are: (1) people are more likely to express preferences for income redistribution when trust in government in their residential area is high; (2) people are more likely to perceive their tax burden as low when trust in government in their residential area is high; and (3) when the sample is divided into people with above average income and those with below average income, these results are only clearly observed for people with above average income and not those with below average income.

Keywords Trust in government · Redistribution · Perception of tax · Inequality

JEL Classification D30 · D63 · H20 · Z13

1 Introduction

Researchers have paid significant attention to the influence of shared societal values on individual's perceptions regarding redistribution and the welfare state (e.g., Gordon 1989; Wenzel 2004, 2005a,b; Klor and Shayo 2010; Feld and Frey 2002, 2007; Luttens and Valfort 2012). For instance, the degree of trust is found to play a key role when tax systems are considered. The greater the level of generalized trust in others, the more

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likely it is that people will pay tax (Scholz and Lubell 1998). Trust in institutional conditions such as government and politics substantially helps establish tax morale and deter tax evasion (Scholz and Pinney 1995; Torgler 2003; Hammar and Jagers 2009). Trust and confidence in such institutions lead people to prefer the welfare state (Algan et al. 2011) and pay tax (Oh and Hong 2012). Consequently, the size of the welfare state is determined partly by the level of social trust (Bergh and Bjørnskov 2011).[1] Recently, the seminal work of Algan et al. (2011) showed that there is a "non-monotonous relationship between trust and the generosity of the welfare sates in OECD countries" (Algan et al. 2011, p. 1). That is, countries with low trust in government can have a high public expenditure rate (e.g., France, Belgium, and Italy), as do countries with high trust in their government (e.g., Scandinavian countries). In contrast, countries with medium levels of trust have low public expenditure rates. Algan et al. (2011) considered Anglo-Saxon countries and Japan to have a medium level of trust, resulting in limited welfare states.

Within a country, there is a wide variation of income, education level, and age. Hence, there is the possibility that the effect of trust on preference for a welfare state varies according to individuals' demographic groups. Concerning the findings of Algan et al. (2011), a question naturally arises: does a medium level of trust lead people to prefer a smaller welfare state in Anglo-Saxon countries and Japan? As suggested by Alesina et al. (2004), in the United States inequality decreased high-income earners' levels of happiness while inequality did not decrease low-income earners' happiness. Hence, perceptions regarding redistribution and welfare states appear to differ between high- and low-income earners in countries with medium levels of trust. Based on data from Japan, Yamamura (2012b) presented evidence that community participation differently influences preferences for redistribution between people with above average income and people with below average income. Therefore, in Anglo-Saxon countries and Japan, the different effects of trust between high- and low-income earners are possibly neutralized. To determine any policy implications, analyzing the role of trust in government rather than generalized trust is a more concrete and suggestive method.[2] Thus, it is worthwhile to investigate the effect of trust in government on the generosity of the welfare state in countries with medium levels of trust. A large number of researchers have explored how and why people prefer income redistribution (e.g., Ravallion and Lokshin 2000; Corneo and Grüner 2002; Alesina and La Ferrara 2005; Rainer and Siedler 2008; Alesina and Giuliano 2009; Klor and Shayo 2010). Recently, based on data from Sweden, Dahlberg et al. (2012) found significant negative effects of increased immigration to support redistribution. Furthermore, they found that the effect was especially pronounced among high-income people. However, no studies have attempted to compare the effect of trust in government on the preference for redistribution between different income groups.[3]

[1] Yamamura (2012a) explored the opposite causality concerning how the size of government influences the level of trust.

[2] Kumlin and Rothstein (2005) asserted that people infer others' trustworthiness from how they perceive public service bureaucrats.

[3] It was found that reducing economic inequality leads to an increase in social trust (Rothstein and Uslaner 2006).

In addition to preference for redistribution, researchers have attempted to assess the determinants of perceptions regarding taxes (e.g., Cuccia and Carnes 2001; Gemmell et al. 2003, 2004; Feld and Larsen 2012).[4] Both preference for redistribution and perceptions regarding taxes are thought to be key factors in producing effective tax policy and efficient welfare states. However, subjective analysis is thought to be biased by various factors, including questionnaire construction and respondents' misunderstandings regarding questions about their subjective views. Therefore, it is important to re-examine findings about subjective views using other approaches (Algan et al. 2011). To show how and the extent to which estimation results for preference for redistribution are reliable, it is worthwhile to assess whether estimations of perceptions about tax are consistent with those for preference for redistribution. By jointly analyzing the role of trust on both preference for redistribution and perceived tax burden, I can provide evidence showing how trust systematically influences individuals' perceptions regarding policy on welfare state.

For this purpose, the present paper used data from the Japanese General Social Surveys (JGSS), which included more than 10,000 observations. Most existing papers are based on cross-country data or on data from countries with heterogeneous populations. Hence, identifying the effect of perceptions, for example perceptions of trust, is difficult. Japan is considered a more racially and culturally homogenous society than Western countries. Hence, the use of the JGSS allows me to naturally control for heterogeneity and therefore identify the effect of trust in government. The key findings of this paper via various specifications estimated by a bivariate ordered probit model are as follows: (1) people are more likely to express preferences for income redistribution in areas where neighbors tend to trust government; (2) people are more likely to perceive their tax burden as low in areas where neighbors tend to trust the government; and (3) when the sample is divided into people with above average income and those with below average income, the first two results are only observed for those with above average income.

The remainder of this paper is organized as follows. In Sect. 2, testable hypotheses are discussed. Section 3 explains data and the empirical method used. Section 4 presents the estimation results and their interpretation. The final section offers some conclusions.

2 Hypotheses

According to the political economy model provided by Algan et al. (2011), "everybody wants more social benefits when he expects to be surrounded by more civic individuals, because there is less fraud on taxes and benefits and officials are more efficient" (Algan et al. 2011, p. 3). Opportunistic uncivic individuals find it difficult to hide their income and so the evasion of income tax is less likely if an uncorrupt government has a sufficient incentive to deter tax evasion. That is, the probability of fraud on

[4] Voters' perceptions of their income tax liabilities are systematically biased towards over-estimation (Gemmell et al. 2004). Overestimation of tax burden is negatively associated with preferences for redistribution. This association is, however, not statistically significant (Gemmell et al. 2003).

taxes seems to depend considerably on the government. If a government is corrupt, the cost of engaging in bribery to evade taxes is lower than if the government is not corrupt. Therefore, it is easier for people to evade taxes when there is a higher level of corruption within a government. That is, a corrupt government reduces the cost for tax evasion and therefore increases the incidence of such fraud. As a result, a corrupt government provides a greater incentive for individuals to become free riders, and civic-minded people begin to distrust their government. Consequently, as suggested by the theoretical model of Oh and Hong (2012), people's distrust in government reduces the willingness to pay taxes. Eventually, individuals are less likely to prefer income redistribution.

I advance Hypothesis 1:

Hypothesis 1 Rich people are more inclined to prefer income redistribution when they live in an area where residents are more likely to trust government.

In Feld and Frey (2002, 2007), a psychological tax contract was determined on the condition that taxpayers and government treat each other with mutual respect and honesty. As discussed above, if a government is corrupt, those who are not civic-minded find it easy to evade taxes. Such collusion between a corrupt government and uncivic individuals clearly contradicts any notions of fairness.[5] If a government were to take such an attitude, which goes against a fair tax system, this would influence the perceptions of taxpayers (Fehr and Schmidt 1999; Galasso 2003; Alesina and Angeletos 2005). In these situations, people perceive that taxes are taken and used for the benefit of the government rather than for society as a whole. Therefore, civic-minded individuals consider that their costs in paying tax are higher than any benefit they receive. In contrast, assuming that fairly paid taxes are used effectively and efficiently to maximize social welfare, the benefit of taxes is greater than the cost to pay taxes. Thus, people trust government. In this case, taxpayers are likely to perceive their tax burden as relatively low. Hence, I advance Hypothesis 2:

Hypothesis 2 People are more inclined to perceive their tax burden as low when they live in an area where residents are more likely to trust government.

3 Data and methods

3.1 Data

Japanese General Social Surveys (JGSS) data, which provide individual-level data, are used in the present paper.[6] JGSS have been conducted since 2000 and were designed as a Japanese counterpart to the General Social Survey data collected in the United States.

[5] Even if there is no collusion, it is possible for a government to manipulate information and make the tax structures complex for the government's benefit, and as a result, taxpayers distrust government. Tax complexity is associated with taxpayers' perceptions of equity when no explicit justification for its complexity and relative economic consequences is offered (Cuccia and Carnes 2001).

[6] Data for this secondary analysis, "Japanese General Social Surveys (JGSS), Ichiro Tanioka," were provided by the Social Science Japan Data Archive, Information Center for Social Science Research on Japan, Institute of Social Science, The University of Tokyo.

A two-stage stratified sampling method was used. The JGSS is conducted throughout Japan and its respondents are adults aged between 20 and 89 years. This paper used a dataset covering 2000, 2001, 2002, 2003, 2005, 2006, and 2008.[7] JGSS respondents were asked standard questions via face-to-face interviews concerning their individual characteristics. From JGSS, researchers can obtain information relating to preferences regarding income redistribution policies, perceived tax burden, trust in government and politics, marital status and age, annual household income,[8] years of schooling, prefecture of residence, and prefecture of residence at 15 years of age. A Japanese prefecture is the equivalent to a state in the United States or a province in Canada. There are 47 prefectures in Japan, and the average value of the variables included in the JGSS can be calculated for each prefecture.

Previous studies have highlighted the significant influence of cultural and social background on individual preferences for income redistribution (Luttmer and Singhal 2011). When comparing within-country analysis and comparative analysis between different countries, "within country analysis is much less likely to be subject to measurement error due to changes in institutional structures of redistributive policies" (Alesina and Giuliano 2009, p. 22). Concerning this point, the use of JGSS data in this paper has a certain advantage. Trust level is inevitably influenced by historical and cultural background, which is difficult to completely control. Therefore, the estimation results of Algan et al. (2011), based on cross-country data, seem to suffer from endogeneity bias. In contrast, Japan shares a common historical and cultural background. Therefore, JGSS data enabled comparisons between the influence of trust on individuals' views regarding redistribution policy and tax burden under the same historical and cultural conditions.

The variables used in the regression estimations are shown in Table 1, which provides definitions and basic statistics (i.e., mean, standard deviation, maximum and minimum value).

Concerning trust in government and politics, the relevant JGSS questions asked:

"How well do you trust ministries and government agencies?"
"How well do you trust diet members?"
"How well do you trust members of municipal councils?"

Concerning these questions, respondents could choose one of three responses: "Not very much" (assigned a value of 1), "some" (assigned a value of 2) and "very much" (assigned a value of 3). Algan et al. (2011) used respondents' trust levels to explore the effect of trust on preference for the welfare state. In their theoretical model, the expectation to be surrounded by civic individuals played a key role. To directly examine their prediction, one must simply consider the type of individuals that actually surround

[7] Surveys were not conducted in 2004 and 2007. Surveys were conducted in 2009 and 2010 but the data are not available.

[8] In the original dataset, annual earnings were grouped into 19 categories, and it was assumed in this study that everyone in each category earned the midpoint value. For the top category of "23 million yen and above", it was assumed in this study that everybody earned 23 million yen. Of the 11,808 observations used in the regression estimations, there were only 116 observations in this category. Therefore, the problem of top-coding should not be an issue here.

Table 1 Definitions and basic statistics

	Definitions	Mean	Standard deviation	Maximum	Minimum
Regional characteristics					
TRUST_ MINIS	Degree of trust for ministries and government agencies: 1 (not very much)–3 (very much). Average values within prefecture where respondents reside.	1.61	0.05	1.77	1.46
TRUST_ DIET	Degree of trust for diet members: 1 (not very much)–3 (very much). Average values within prefecture where respondents reside.	1.40	0.04	1.53	1.32
TRUST_ MUNI	Degree of trust for members of municipal councils: 1 (not very much)–3 (very much). Average values within prefecture where respondents reside.	1.51	0.06	1.66	1.34
SOUNDNESS	100—ratio of underground economy (%)	96.9	0.64	97.8	95.3
AVINCOM	Average household income within a prefecture (million yen)	6.12	0.83	7.99	3.52
GINI	Gini coefficients for 1999	0.29	0.01	0.35	0.27
Individual characteristics					
EQUAL	Degree of agreement with the argument that the government should reduce income inequality: 1 (strongly disagree)–5 (strongly agree)	3.72	1.03	5	1
TAX	Degree of perceived tax burden: 1 (too low)–5 (too high)	4.22	0.84	5	1
INCOM	Individual household income (million yen)	6.23	4.18	23	0
AGE	Ages	53.5	15.2	89	20
MARRY	Takes 1 if respondents are currently married, otherwise 0.	0.82	–	1	0

Table 1 continued

	Definitions	Mean	Standard deviation	Maximum	Minimum
SCHOOL	Years of schooling	12.2	2.55	18	6
UNEMP	Takes 1 if respondents are currently unemployed, otherwise0.	0.01	–	1	0
MALE	Takes 1 if respondents are male, otherwise 0.	0.49	–	1	0
PROG_1	Concerning political views, it takes 1 if respondents choose 1, otherwise 0. 1 (conservative)–5 (progressive)	0.08	–	1	0
PROG_2	Concerning political views, it takes 1 if respondents choose 2, otherwise 0. 1 (conservative)–5 (progressive)	0.20	–	1	0
PROG_3	Concerning political views, it takes 1 if respondents choose 3, otherwise 0 1 (conservative)–5 (progressive)	0.50	–	1	0
PROG_4	Concerning political views, it takes 1 if respondents choose 4, otherwise 0. 1 (conservative)–5 (progressive)	0.18	–	1	0
PROG_5	Concerning political views, it takes 1 if respondents choose 5, otherwise 0. 1 (conservative)–5 (progressive)	0.04	–	1	0

All observations are used. Absolute values of t-statistics are the results of a mean difference test between high- and low-income household groups
*, **, and *** indicate significance at the 10, 5, and 1 % levels, respectively

the respondents (Shields et al. 2009). In addition, causality between the trust level and preference is ambiguous because the proxy for trust is considered an endogenous variable. That is, those who prefer a welfare state are likely to trust the government. This inevitably causes endogeneity bias. To avoid endogeneity bias, following Yamamura (2012b), the present paper uses trust level in residential area, rather than the individual's trust level. I calculated average values within each prefecture and used these values as measures of trust in government and politics.

Several problems remain even when the average value of trust within a prefecture is used. (1) As argued previously, the theoretical argument mainly revolves around the type of individuals surrounding the respondent. However, a prefecture is thought to cover a larger area than a community, and therefore the average value within a prefecture does not appropriately match the theoretical concept of neighborhoods. (2) A person living in a neighborhood with high trust is himself likely to have high trust; neighborhood attitudes may then just be a noisy measure of an individual's attitude. To deal with these problems, an alternative index also should be used. For instance, the revelation of widespread fraud (regarded as an exogenous event) is thought to be associated with trust level. Therefore, the effect of the revelation of widespread fraud on support for redistribution policies or perceptions of tax must be investigated. However, because of a scarcity of data regarding fraud, an index of widespread fraud cannot be used. As observed worldwide (e.g., Bajada 1999; Tanzi 1999; Schneider and Enste 2000; Bajada and Schneider 2005), there are groups that carry out illegal activities that enlarge the scale of a country's underground economy where fraud on taxes is usually committed. Hence, it is plausible that those who have a legal obligation to pay tax do not support tax evasion by under-the-table workers. Corrupt government is thought to turn a blind eye towards such illegal activity and fraudulence. As a consequence, people distrust the government because of the government's attitude. Therefore, the scale of the underground economy indirectly captures the degree of widespread fraud. It is possible to estimate the scale of the underground economy in Japan (Kadokura 2002) as the ratio of products in Japan's underground economy to GDP (%). This can be obtained in each prefecture for 1998, which is prior to the first JGSS (Kadokura 2002). Therefore, the ratio of products in Japan's underground economy in 1998 can be used as a predetermined variable. Furthermore, for the convenience of comparing results concerning other variables to capture the degree of trust, the degree of formal economic activities is used as an alternative variable, instead of the ratio of underground economy. The degree of formal economic activities is defined as what is left after subtracting the ratio of underground economy [100—ratio of underground economy (%)]. This ratio is considered as SOUNDNESS (financial soundness of the economy). As above, I assumed that a revelation of widespread fraud is associated with trust level. This assumption can be checked by looking at Table 2. The correlation coefficient between SOUNDNESS and TRUST_MINIS (or TRUST_DIET) is 0.51 and is statistically significant at the 1 % level. Similarly, the correlation coefficient between SOUNDNESS and TRUST_MUNI is 0.56 and statistically significant at the 1 % level. These results reveal a significant positive association between SOUNDNESS and degree of trust concerning government, which is in line with the assumption. Naturally, SOUNDNESS is appropriate to be used as an alternative measure of degree of trust for government.

Table 2 Correlation matrix for main variables used for baseline model

	EQUAL	TAX	TRUST_ MINIS	TRUST_ DIET	TRUST_ MUNI	SOUNDNESS	AVINCOM	GINI	INCOM	AGE	MARRY	SCHOOL	UNEMP	MALE
EQUAL	1.00													
TAX	0.04***	1.00												
	(0.00)													
TRUST_MINIS	0.04***	−0.01*	1.00											
	(0.00)	(0.09)												
TRUST_DIET	0.03***	−0.01	0.76***	1.00										
	(0.00)	(0.14)	(0.00)											
TRUST_MUNI	0.04***	−0.01	0.72***	0.83***	1.00									
	(0.00)	(0.17)	(0.00)	(0.00)										
SOUNDNESS	0.06***	−0.01	0.51***	0.51***	0.56***	1.00								
	(0.00)	(0.11)	(0.00)	(0.00)	(0.00)									
AVINCOM	−0.06***	0.0001	−0.33***	−0.07***	−0.02***	−0.50***	1.00							
	(0.00)	(0.93)	(0.00)	(0.00)	(0.00)	(0.00)								
GINI	−0.003	−0.005	−0.05***	−0.19***	−0.14***	−0.39***	−0.10***	1.00						
	(0.69)	(0.64)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)							
INCOM	−0.15***	0.04***	−0.07***	−0.02**	−0.04***	−0.11***	0.20***	−0.01	1.00					
	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.14)						
AGE	0.11***	−0.06***	0.02**	0.01*	0.01**	0.03***	−0.04***	−0.01*	−0.19***	1.00				
	(0.00)	(0.00)	(0.02)	(0.06)	(0.02)	(0.00)	(0.00)	(0.06)	(0.00)					
MARRY	−0.007	0.01	0.004	0.02**	0.01	0.01*	0.04***	−0.01*	0.23***	−0.02***	1.00			
	(0.44)	(0.18)	(0.59)	(0.01)	(0.14)	(0.07)	(0.00)	(0.05)	(0.00)	(0.00)				
SCHOOL	−0.13***	0.0003	−0.11***	−0.09***	−0.11***	−0.16***	0.14***	0.02***	0.33***	−0.42***	0.10***	1.00		
	(0.00)	(0.97)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)			

Table 2 continued

	EQUAL	TAX	TRUST_ MINIS	TRUST_ DIET	TRUST_ MUNI	SOUNDNESS	AVINCOM	GINI	INCOM	AGE	MARRY	SCHOOL	UNEMP	MALE
UNEMP	0.01*	0.003	−0.001	−0.005	−0.003	0.001	−0.03***	0.04***	−0.05***	−0.03***	−0.06***	−0.01	1.00	
	(0.05)	(0.78)	(0.94)	(0.54)	(0.67)	(0.88)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.28)		
MALE	0.02***	−0.003	0.004	0.01**	0.01	0.01**	0.01	−0.02**	0.04***	0.04***	0.11***	0.10***	0.03***	1.00
	(0.00)	(0.76)	(0.59)	(0.02)	(0.35)	(0.06)	(0.22)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	

Numbers in parentheses are *p*-statistics

*, **, and *** indicate significance at the 10, 5 and 1 % levels, respectively

Gini data coefficients for prefecture level household income were calculated using data from the "National Survey of Family Income and Expenditure", conducted by the Ministry of Internal Affairs and Communications (1999). These surveys are conducted every 5 years, e.g., 1999, 2004, and 2009. The data used in this paper cover the period 2000–2008. Therefore, as explained in the following section, I used Gini coefficients for 1999 as an initial value. The average household income within a prefecture (AVINCOM) is calculated based on JGSS data. The utility of people is thought to be affected not only by one's own income but also by the income level of neighboring people (e.g., Clark and Oswald 1996; Luttmer 2005). In other words, not only absolute income but also relative income is considered to be related to an individual's utility and, therefore, perceptions. In the present paper, both individual-level household income and average household income within residential prefectures are controlled for to capture the relative income effect. I matched the information regarding individual characteristics sourced from JGSS data with prefecture characteristics such as trust in government and politics proxies, Gini coefficients, and average income level. Thus, I was able to investigate how characteristics of residential area affect an individual's preference for income redistribution and perceived tax burden.

With respect to individual characteristics, EQUAL are proxies for preferences for income redistribution. A question from the JGSS asked: What is your opinion of the following statement? "It is the responsibility of the government to reduce the differences in income between families with high incomes and those with low incomes." There were five response options, ranging from "1 (strongly disagree)" to "5 (strongly agree)". EQUAL is the values that the respondents chose. The JGSS also asked the following question: "Do you think the amount of income tax you have to pay is high?" There were five response options: "1 (too low)", "2 (somewhat low)", "3 (about right)", "4 (somewhat high)", and "5 (too high)". *TAX* is the response options chosen by the respondents. In Table 1, average values of EQUAL and TAX are 3.72 and 4.22, suggesting that people are more likely to prefer redistribution and believe that income taxes are too high. That is, people support redistribution policies if they are not obliged to pay tax, which is in line with the argument of expressive voting theory (e.g., Tullock 1971; Copeland and Laband 2002; Sobel and Wagner 2004; Hillman 2010).

It is plausible to argue that political ideology is one of determinants concerning preferences for redistribution and so should be controlled for when preferences for income redistribution are estimated (Alesina and Giuliano 2009). The JGSS also asked: "Where would you place your political views on a 5-point scale?" There are five response options: "1 (conservative)" to '5 (progressive)". Based on responses to that question, I constructed a proxy for capturing a political ideology effect. Political views are captured by dummies: PROG_5 takes the value of 1 when the response is "5", otherwise 0. PROG_1, PROG_2, PROG_3, and PROG_4 are defined in a similar manner.

As shown in Table 1, the average household income is 6.12 million yen. As stated in Alesina et al. (2004), perception and preference possibly change according to income group. Therefore, it is worthwhile to compare results between different income groups. Following Alesina et al. (2004), in the present paper, the sample is divided into two groups: people with a household income of more than 6 million yen, the average

Table 3 Comparison of key variables: "Group of household income over Average household income" versus "Group of household income is average household income or below average household income"

	Household income >Average household income	Household income <=Average household income	t-value
EQUAL	3.54	3.85	15.6 * **
TAX	4.25	4.20	2.54 * *
TRUST_MINIS	1.61	1.62	6.29 * **
TRUST_DIET	1.40	1.40	0.58
TRUST_MUNI	1.51	1.52	2.82 * **

The high-income group is those respondents with an annual household income higher than 6 million yen. The low-income group is those respondents with an annual household income lower than (or equivalent to) 6 million yen. All observations are used. Absolute values of t-value are the results of a mean difference test between high- and low-income household groups
*** indicates significance at the 1 % level

household income, and those with a household income of 6 million yen or less. In this paper, the former group is defined as those with an above average income while the latter group is defined as those with a below average income. People with a household income between 3 and 4 million yen are the most common income group. Hence, household income from 0 to 6 million yen covered both low- and medium-level income earners. The estimation results will possibly change when the cut-off income changes. Hence, in addition to average income, the median income, 5 million yen, is used as the cut-off income. That is, the sample is also divided into people with a household income of more than 5 million yen and those with a household income of 5 million yen or less. These two subsamples are used for alternative estimations for robustness checks.

Table 3 shows differences in the key variables between those with above average income and those with below average income. The table shows that the value for EQUAL for people with below average income is larger (by 0.31 on the 5-point scale) than for those with above average income, and is statistically significant at the 1 % level. This is consistent with the expectation that poorer people are more likely to prefer income redistribution to increase their welfare. The value of TAX for those with above average income is larger by 0.05 on the 5-point scale than for those with a below average income. Furthermore, it is statistically significant at the 1 % level. The combined results of EQUAL and TAX can be interpreted to represent that those with below average income would accept the benefits from redistribution policies at the expense of burdens on those with above average income. Turning now to the proxies for trust in government and politics, the values for TRUST_MINIS and TRUST_MUNI for those with below average income are larger than for those with above average income, and are statistically significant at the 1 % level. This implies that those with below average income are more likely to live in areas where neighbors trust ministers, government agencies, and also municipal councils compared with those with above average income.

3.2 Econometric framework and estimation strategy

For the purpose of examining the hypotheses proposed the previous section, the estimated function of the baseline model takes the following form:[9]

$$\begin{aligned}\mathrm{EQUAL_{im}(or\ TAX_{im})} &= \alpha_0 + \alpha_1\,\mathrm{TRUST\_MINIS}\\ &\quad(\text{or TRUST\_DIET or TRUST\_MUNI})_m + \alpha_2\mathrm{AVINCOM_m} + \alpha_3\mathrm{GINI_m}\\ &\quad+\alpha_4\mathrm{INCOM_{im}} + \alpha_5\mathrm{AGE_{im}} + \alpha_6\mathrm{MARRY_{im}} + \alpha_7\mathrm{SCHOOL_{im}}\\ &\quad+\alpha_8\mathrm{UNEMP_{im}} + \alpha_9\mathrm{MALE_{im}} + \alpha_{10}\mathrm{PROG\_2_{im}} + \alpha_{11}\mathrm{PROG\_3_{im}}\\ &\quad+\alpha_{12}\mathrm{PROG\_4_{im}} + \alpha_{13}\mathrm{PROG\_5_{im}} + u_{im},\end{aligned}$$

where $\mathrm{EQUAL_{im}}$ (or $\mathrm{TAX_{im}}$) represents the dependent variable for individual i and prefecture m. Regression parameters are represented by α. As explained earlier, values for EQUAL and TAX range from 1 to 5 and an ordered probit model is appropriate for the estimations. The error term is represented by u_{im}.[10] Furthermore, disturbances in the equation when EQUAL is a dependent variable may correlate with disturbances when TAX is a dependent variable. Both EQUAL and TAX should be jointly estimated because of correlations between disturbances. In this case, a bivariate ordered probit model is preferred (Greene 2008, 835–836).[11] Hence, I used a bivariate ordered probit model for the estimations.

As is exhibited in the correlation matrix of Table 2, the correlation coefficient between TRUST_MINIS and TRUST_DIET is 0.76 and statistically significant at the 1 % level. The correlation coefficient between TRUST_MINIS and TRUST_MUNI is 0.72 and statistically significant at the 1 % level. In addition, the correlation coefficient between TRUST_MUNI and TRUST_DIET is 0.83 and statistically significant at the 1 % level. These suggest a strong correlation between the proxies for trust in government and politics. Therefore, multicollinearity occurs when these three variables are incorporated as independent variables at the same time. To avoid multicollinearity, one variable is incorporated when the other two are not. From Hypothesis 1, these proxies for trust in government are predicted to have the positive sign when EQUAL is the dependent variable. Furthermore, from Hypothesis 2, the proxies for trust in government are expected to have the negative sign when TAX is the dependent variable.

[9] In the equation, people's actual tax burden is not included in the dependent variables, even though two people with identical incomes may pay substantially different amounts of taxes. However, in a large sample, people's actual tax burden is unlikely to be a factor, and there will generally be a positive relationship between the level of income and tax burden.

[10] It is reasonable to assume that the observations may be spatially correlated within a prefecture, as the preference of one agent may well relate to the preference of another in the same prefecture. To consider such spatial correlation in line with this assumption, I used the Stata cluster command and calculated z-statistics using robust standard errors. The advantage of this approach is that the magnitude of spatial correlation can be unique to each prefecture.

[11] A bivariate ordered probit model is commonly used in empirical economic analyses (Calhoun 1995; Butler and Chatterjee 1997).

AVINCOM and GINI are included to capture the effects of relative income and income inequality within a prefecture. Luttmer (2005) argued that increases in average income within a locality lead to reductions in the residents' welfare. People are thought to support redistribution to improve their welfare. In the present paper, AVINCOM is expected to have the positive sign when the determinants of EQUAL are ascertained. What is more, in comparison with neighbors, individuals perceive their tax burden as high. AVINCOM is expected to have the positive sign when the determinants of TAX are ascertained. However, we infer that a high AVINCOM causes people to expect that they can also earn more. As suggested by the "prospect of upward mobility" (POUM) theory (Bénabou and Ok 2001), people who expect to move up the income scale will not support a redistribution policy even if they are currently poor. Hence, the sign for AVINCOM is likely to become negative when the determinants of EQUAL are assessed. Furthermore, individuals perceive their tax burden as low and so the sign for AVINCOM is likely to become negative when the determinants of TAX are assessed. If people wish to address inequality, the sign for GINI should be positive in the estimation where EQUAL is a dependent variable. The greater the income inequality, the more important paying taxes becomes for income redistribution. Hence, GINI is predicted to have the negative sign in the estimation for the determinants of TAX.

Following previous literature (e.g., Ravallion and Lokshin 2000; Corneo and Grüner 2002; Ohtake and Tomioka 2004; Alesina and La Ferrara 2005; Rainer and Siedler 2008; Alesina and Giuliano 2009; Yamamura 2012b), the present paper used INCOME, AGE, MARRY, SCHOOL, and MALE as independent variables to control for individual characteristics. The generosity of the welfare state appears to depend not only on economic conditions but also on individuals' political views. For the purpose of capturing political views, PROG_2–PROG_5 are included and PROG_1 (conservative view) is the reference group. Liberal views are generally considered to support left-wing policies such as political income redistribution. Accordingly, the coefficients of PROG_2–PROG_5 are predicted to take the positive sign, with the absolute value of the coefficient PROG_5 to be largest among them.

4 Estimation results

The estimation results are exhibited in Tables 4, 5(a, b), 6(a, b). In each table, the results of the specifications with TRUST_MINIS, TRUST_DIET, TRUST_MUNI, and SOUNDNESS are presented in columns (1), (2), (3) and (4), respectively. The upper part of each table exhibits results when EQUAL is a dependent variable, whereas the lower part of each table presents results when TAX is a dependent variable. The results based on the full sample are reported in Table 4. After dividing the sample into two groups, results based on the sample of people with above average income are shown in Table 5(a), and results based on those with below average income are exhibited in Table 6(a). In addition, for a robustness check, results based on a sample of people with an income above the median are exhibited in Table 5(b), and results based on those with an income below the median are shown in Table 6(b).

Table 4 Baseline model: dependent variable is EQUAL and TAX (Bivariate ordered probit model)

	(1)		(2)		(3)		(4)	
	Coefficient	z-value	Coefficient	z-value	Coefficient	z-value	Coefficient	z-value
Dependent variable: EQUAL								
Regional characteristics								
TRUST_MINIS	0.25	1.04						
TRUST_DIET			0.55 * *	2.15				
TRUST_MUNI					0.54 * **	3.09		
SOUNDNESS							0.04*	1.75
AVINCOM	−0.04 * **	−2.86	−0.04 * **	−3.81	−0.03 * **	−3.13	−0.02	−1.38
GINI	−1.08	−1.27	−0.77	−0.91	−0.76	−0.94	−0.10	−0.10
Individual characteristics								
INCOM	−0.03 * **	−8.76	−0.03 * **	−8.76	−0.03 * **	−8.76	−0.03 * **	−8.71
AGE	0.005***	7.11	0.005***	7.11	0.005***	7.17	0.005***	7.19
MARRY	0.02	0.82	0.02	0.81	0.02	0.78	0.02	0.78
SCHOOL	−0.03 * **	−6.85	−0.03 * **	−6.79	−0.03 * **	−6.63	−0.03 * **	−6.69
UNEMP	0.16	1.08	0.16	1.08	0.16	1.10	0.16	1.06
MALE	0.02	0.82	0.02	0.97	0.02	0.97	0.02	0.96
PROG_1	<Reference group>							
PROG_2	0.02	0.45	0.02	0.45	0.02	0.43	0.02	0.44
PROG_3	0.09	1.53	0.09	1.56	0.09	1.53	0.09	1.53
PROG_4	0.17 * **	3.59	0.18 * **	3.10	0.17 * **	3.06	0.17 * **	3.06
PROG_5	0.25 * **	3.50	0.26 * *	2.29	0.25 * *	2.28	0.26 * *	2.29
Dependent variable: TAX								
Regional characteristics								
TRUST_MINIS	−0.43*	−1.85						
TRUST_DIET			−0.45	−1.55				

Table 4 continued

	(1)		(2)		(3)		(4)	
	Coefficient	z-value	Coefficient	z-value	Coefficient	z-value	Coefficient	z-value
TRUST_MUNI					-0.33	−1.53		
SOUNDNESS							−0.06***	−3.12
AVINCOM	−0.01	−0.79	−0.01	−0.33	−0.01	−0.50	−0.03	−1.61
GINI	−0.64	−0.59	−0.80	−0.73	−0.73	−0.69	−1.90*	−1.74
Individual characteristics								
INCOM	0.01***	2.97	0.01***	2.96	0.01***	2.97	0.01***	2.99
AGE	−0.004***	−3.74	−0.004***	−3.79	−0.004***	−3.78	−0.004***	−3.78
MARRY	0.04	1.44	0.04	1.42	0.04	1.41	0.04	1.47
SCHOOL	−0.02***	−3.44	−0.02***	−3.45	−0.02***	−3.49	−0.02***	−3.60
UNEMP	0.02	0.21	0.02	0.23	0.02	0.22	0.02	0.25
MALE	0.02	0.68	0.02	0.69	0.02	0.68	0.02	0.72
PROG_1	<Reference group>							
PROG_2	−0.009	−0.16	−0.01	−0.17	−0.009	−0.16	−0.008	−0.15
PROG_3	0.18***	3.73	0.18***	3.71	0.18***	3.75	0.18***	3.74
PROG_4	0.16***	3.35	0.16***	3.35	0.17***	3.39	0.17***	3.38
PROG_5	0.52***	5.01	0.52***	5.02	0.53***	5.02	0.52***	4.99
Log pseudo likelihood	−19,185		−19,184		−19,182		−19,182	
Observations	7,768		7,768		7,768		7,768	

Values are coefficients. Numbers in parentheses are z-values calculated using robust standard errors clustered in the prefecture. In all estimations, constant and year dummies are included as independent variables but are not reported because of space limitations

*, **, and *** indicate significance at the 10, 5, and 1 % levels, respectively

4.1 Results based on full sample

Table 4 shows that the signs of the coefficients for the proxies for trust in government, TRUST_MINIS, TRUST_DIET, TRUST_MUNI, and SOUNDNESS, have the expected positive signs in all estimations. Furthermore, they are statistically significant, with the exception of TRUST_MINIS. Concerning results showing statistical significance, the values of the coefficients of TRUST_DIET and TRUST_MUNI are 0.55 and 0.54, respectively.[12] In contrast, the value of SOUNDNESS is 0.04, which is smaller than that of TRUST_DIET and TRUST_MUNI. The reason for this difference is that the scale of SOUNDNESS is shown as a percentage (Table 1) and is therefore different from that of TRUST_DIET and TRUST_MUNI. These results suggest that variables regarding trust have a positive effect on EQUAL. This is congruent to Hypothesis 1.

With respect to the control variables, the coefficient of AVINCOM yields the negative sign in all columns. Furthermore, it is statistically significant with the exception of column (4). This suggests that the higher the average income is within a residential area, the fewer people there are who support redistribution policies. As explained earlier, in this estimation, GINI is included to capture income inequality. Accordingly, I interpret the result of AVINCOM to imply that the richer the society, the less inclined people are to require a redistribution policy when income inequality is controlled. The result of GINI is not statistically significant and has the negative sign in all columns. It follows then that income inequality is not associated with people's preferences for redistribution, which is not consistent with the expectation. One reason for this result could be that the influence of income inequality differs according to income group, such as high- and low-income groups (Alesina et al. 2004). The effect of GINI would be attenuated if GINI had the opposite effect between groups. With respect to individual characteristics, the coefficient of INCOME has the negative sign and is statistically significant at the 1 % level in all estimations. This implies that people are less likely to depend on redistribution policies when people earn more. AGE has the positive sign and is statistically significant in all columns. In general, older people have poorer health than young people. Therefore, older people are expected to prefer social security and income redistribution policies. As the sample includes retirees, it is not surprising this result was obtained. The coefficient of SCHOOL has the negative sign and is statistically significant at the 1 % level in all columns. This result is considered to reflect that people with a higher level of education are more likely to expect higher future earnings, and therefore do not rely on redistribution policies.

[12] The coefficients of independent variables reflect the magnitude of the effect of an independent variable on a dependent variable. However, the coefficients of independent variables cannot be interpreted as marginal effects and are difficult to interpret in an ordered probit model. Hence, to determine their economic significance, marginal effects should be determined. The marginal effects can be calculated using a dependent variable's values. Using EQUAL as an example, the values for EQUAL range between 1 and 5 and therefore the marginal effects of the dependent variables vary according to the values of EQUAL. That is, the marginal effects of independent variables on the probability that EQUAL has a value of 5, their marginal effect on the probability that EQUAL is 4, their marginal effect on the probability that EQUAL is 3, their marginal effect on the probability that EQUAL is 2, and their marginal effect on the probability that EQUAL is 1 (Greene 2008, 831–835). These marginal effects are not reported because of space limitations. Results concerning marginal effects are available upon request to the author.

Table 5 Dependent variable is EQUAL and TAX: (a) Household income > Average household income (6 million yen), (b) Household income > Median household income (5 million yen) (Bivariate ordered probit model)

	(1)		(2)		(3)		(4)	
	Coefficient	z-value	Coefficient	z-value	Coefficient	z-value	Coefficient	z-value
(a)[a]								
Dependent variable: EQUAL								
Regional characteristics								
TRUST_MINIS	0.77**	2.10						
TRUST_DIET			1.24***	3.74				
TRUST_MUNI					0.91***	3.69		
SOUNDNESS							0.08**	2.40
AVINCOM	0.004	0.25	−0.009	−0.60	0.0009	0.05	0.0003	1.16
GINI	2.23**	2.47	3.11***	3.21	2.75***	3.31	4.14***	3.25
Individual characteristics								
INCOM	−0.03***	−4.79	−0.03***	−4.80	−0.03 * **	−4.81	−0.03 * **	−4.75
AGE	0.008***	4.04	0.008***	4.02	0.008***	4.02	0.008***	4.02
MARRY	−0.02	−0.40	−0.02	−0.37	−0.02	−0.39	−0.02	−0.39
SCHOOL	−0.03***	−4.93	−0.03***	−4.73	−0.03***	−4.76	−0.03***	−4.72
UNEMP	0.50***	2.76	0.50***	2.76	0.51***	2.78	0.50***	2.76
MALE	−0.04	−1.16	−0.04	−1.21	−0.04	−1.21	−0.04	−1.23
PROG_1	<Reference group >							
PROG_2	0.03	0.37	0.03	0.34	0.03	0.34	0.03	0.38
PROG_3	0.07	0.97	0.07	0.94	0.07	0.90	0.07	0.95
PROG_4	0.15	1.64	0.14	1.63	0.14	1.59	0.14	1.64
PROG_5	0.26	1.59	0.26	1.60	0.26	1.60	0.27	1.64

Table 5 continued

	(1)		(2)		(3)		(4)	
	Coefficient	z-value	Coefficient	z-value	Coefficient	z-value	Coefficient	z-value
Dependent variable: TAX								
Regional characteristics								
TRUST_MINIS	−0.72*	−1.83						
TRUST_DIET			−1.21***	−2.86				
TRUST_MUNI					−0.98***	−2.97		
SOUNDNESS							−0.07*	−1.74
AVINCOM	−0.03	−1.19	−0.02	−0.96	−0.03	−1.25	−0.06	−1.61
GINI	0.75	0.59	−0.13	−0.09	0.21	0.09	−0.90	−0.49
Individual characteristics								
INCOM	0.01***	3.57	0.01***	3.61	0.01***	3.58	0.01***	3.56
AGE	0.0008	0.03	0.0007	0.03	0.0007	0.03	0.0007	0.03
MARRY	0.09	1.47	0.09	1.43	0.09	1.46	0.09	1.46
SCHOOL	−0.00002	−0.00	−0.0008	−0.10	−0.001	−0.22	−0.001	−0.13
UNEMP	−0.23	−1.15	−0.24	−1.16	−0.24	−1.16	−0.23	−1.14
MALE	0.01	0.26	0.01	0.29	0.01	0.30	0.01	0.29
PROG_1	<Reference group>							
PROG_2	0.02	0.33	0.02	0.35	0.03	0.36	0.02	0.32
PROG_3	0.21**	2.49	0.21**	2.51	0.21**	2.55	0.21**	2.49
PROG_4	0.19**	2.20	0.19**	2.22	0.19**	2.29	0.19**	2.21
PROG_5	0.76***	4.07	0.76***	4.08	0.76***	4.09	0.76***	4.06
Log pseudo likelihood	−8,701		−8,696		−8,695		−8,700	
Observations	3,053		3,053		3,053		3,053	

Table 5 continued

	(1)		(2)		(3)		(4)	
	Coefficient	z-value	Coefficient	z-value	Coefficient	z-value	Coefficient	z-value
(b)[b]								
Dependent variable: EQUAL								
Regional characteristics								
TRUST_MINIS	0.61*	1.73						
TRUST_DIET			1.13***	3.53				
TRUST_MUNI					0.82***	3.40		
SOUNDNESS							0.09***	3.09
Dependent variable: TAX								
Regional characteristics								
TRUST_MINIS	−0.84**	−2.16						
TRUST_DIET			−1.30***	−3.01				
TRUST_MUNI					−0.94***	−2.87		
SOUNDNESS							−0.07*	−1.77
Logpseudo likelihood	−10,430		−10,424		−10,424		−10,429	
Observations	4,230		4,230		4,230		4,230	

[a] Values are coefficients. Numbers in parentheses are z-values calculated using robust standard errors clustered in the prefecture. In all estimations, constant and year dummies are included as independent variables but are not reported because of space limitations

*, **, and *** indicate significance at the 10, 5, and 1 % levels, respectively

[b] Values are coefficients. Numbers in parentheses are z-statistics calculated using robust standard errors clustered in the prefecture. In all estimations, control variables used in Table (a) are included as independent variables but are not reported because of space limitations

*, **, and *** indicate significance at the 10, 5, and 1 % levels, respectively

UNEMP and MALE have the positive sign, but are not statistically significant in all estimations, implying that job status and gender do not influence preference for redistribution policies. Regarding political views, the coefficients of PROG_2–PROG_5 have the positive sign in all columns and PROG_4 and PROG_5 are statistically significant in all columns. Furthermore, PROG_5 has the largest coefficient, followed by PROG_4. This means that the more liberal people are, the more inclined they are to support an income redistribution policy. This is in line with the expectation.

The results of estimations for TAX show that the coefficient signs for TRUST_MINIS, TRUST_DIET, TRUST_MUNI, and SOUNDNESS produce the expected negative signs in all estimations. Furthermore, they are statistically significant in columns (1) and (4). This suggests that trust in government leads people to perceive their tax burden as low; however, statistical significance varies according to the specifications used. This result is, to a certain extent, consistent withHypothesis 2.

In terms of the control variables, the coefficients of AVINCOM and GINI produce negative signs in all columns. However, they are not statistically significant, with the exception of GINI in column (4). Hence, the economic conditions of a residential area such as average income and income inequality do not influence people's perceived tax burden. Turning to individual characteristics, the coefficient of INCOME has the positive sign and is statistically significant at the 1 % level in all estimations. This is interpreted to reflect that the higher people's income, the heavier the tax burden becomes under the progressive tax system. AGE has the negative sign and is statistically significant in all columns, possibly because retired people in Japan are typically 65 years and older and do not bear a heavy tax burden. The coefficient of SCHOOL has the negative sign and is statistically significant at the 1 % level in all columns. Thus, people with higher levels of education are more inclined to expect higher future earnings. If this holds true, compared with their future tax burden, the current tax burden is perceived as low. UNEMP and MALE have the positive sign, but are not statistically significant in all estimations. Hence, job status and gender have no influence on perceived tax burden. As for political views, with the exception of PROG_2, the coefficients of PROG_3–PROG_5 have the positive sign and are statistically significant in all columns. Furthermore, PROG_5 has the largest coefficient. This means that the more liberal people are, the more inclined they are to perceive the tax burden as high. As discussed earlier, liberal people are apt to support redistribution policies. That is, even after controlling for income level, liberal people prefer redistribution and are willing to bear the cost of such policies. It can be argued then that liberal people are likely to pursue the benefits of redistribution, and are unlikely to consider the costs of such policies.

4.2 Results based on sample of people with above average income

Hypotheses 1 and 2 are supported as shown in the previous section. However, as argued by Alesina et al. (2004), people in high- and low-income groups have different perceptions. This is especially so for high-income earners because income tax in Japan is progressive. High-income earners are obliged to pay higher tax than low-income earners. In contrast, there is just a small tax burden for low-income earners. However,

Table 6 Dependent variable is EQUAL and TAX: (a) Household income < =Average household income (6 million yen), (b) Household income > Median household income (5 million yen) (Bivariate ordered probit model)

	(1)		(2)		(3)		(4)	
	Coefficient	z-value	Coefficient	z-value	Coefficient	z-value	Coefficient	z-value
(a)[a]								
Dependent variable: EQUAL								
Regional characteristics								
TRUST_MINIS	−0.13	−0.58						
TRUST_DIET			0.04	0.14				
TRUST_MUNI					0.28	1.40		
SOUNDNESS							0.02	0.87
AVINCOM	−0.07 * **	−4.36	−0.07 * **	−4.68	−0.07 * **	−4.46	−0.06 * **	−3.07
GINI	−3.40 * **	−2.83	−3.34 * **	−2.78	−3.19 * **	−2.73	−2.89 * *	−2.22
Individual characteristics								
INCOM	−0.02*	−1.79	−0.02*	−1.79	−0.02*	−1.78	−0.02*	−1.79
AGE	0.003 * **	3.81	0.003 * **	3.83	0.003 * **	3.86	0.003 * **	3.89
MARRY	0.03	0.84	0.03	0.82	0.03	0.79	0.03	0.80
SCHOOL	−0.03 * **	−4.97	−0.03 * **	−4.94	−0.03 * **	−4.79	−0.03 * **	−4.88
UNEMP	0.02	0.12	0.02	0.13	0.02	0.15	0.02	0.13
MALE	0.07*	1.96	0.07*	1.96	0.07*	1.96	0.07*	1.95
PROG_1	<Reference group >							
PROG_2	0.02	0.28	0.02	0.28	0.01	0.27	0.01	0.27
PROG_3	0.10	1.27	0.10	1.28	0.10	1.29	0.10	1.28
PROG_4	0.21 * **	2.70	0.21 * **	2.70	0.21 * **	2.70	0.21 * **	2.70
PROG_5	0.23*	1.65	0.23*	1.66	0.23*	1.66	0.23*	1.66

Table 6 continued

	(1)		(2)		(3)		(4)	
	Coefficient	z-value	Coefficient	z-value	Coefficient	z-value	Coefficient	z-value
Dependent variable: TAX								
Regional characteristics								
TRUST_MINIS	−0.12	−0.39						
TRUST_DIET			0.25	0.61				
TRUST_MUNI					0.23	0.70		
SOUNDNESS							−0.04	−1.17
AVINCOM	0.01	0.56	0.01	0.84	0.02	0.88	0.006	0.02
GINI	−1.98	−1.44	−1.82	−1.35	−1.81	−1.34	−2.75*	−1.87
Individual characteristics								
INCOM	−0.01	−1.41	−0.01	−1.39	−0.01	−1.39	−0.01	−1.39
AGE	−0.007***	−6.17	−0.007***	−6.13	−0.007***	−6.17	−0.01***	−6.09
MARRY	0.04	1.23	0.04	1.20	0.04	1.19	0.04	1.29
SCHOOL	−0.03***	−3.90	−0.03***	−3.82	−0.03***	−3.81	−0.03***	−3.93
UNEMP	0.12	1.09	0.12	1.13	0.12	1.14	0.12	1.11
MALE	0.02	0.84	0.02	0.83	0.02	0.84	0.02	0.86
PROG_1	>Reference group>							
PROG_2	−0.02	−0.29	−0.01	−0.28	− 0.02	−0.29	−0.01	−0.28
PROG_3	0.17***	2.83	0.17***	2.86	0.17***	2.86	0.17***	2.84
PROG_4	0.16**	2.43	0.16**	2.44	0.16**	2.43	0.16**	2.43
PROG_5	0.37***	3.50	0.37***	3.52	0.37***	3.50	0.37***	3.49
Log pseudo likelihood	−10,423		−10,423		−10,422		−10,422	
Observations	4,265		4,265		4,265		4,265	

Table 6 continued

	(1)		(2)		(3)		(4)	
	Coefficient	z-value	Coefficient	z-value	Coefficient	z-value	Coefficient	z-value
(b)[b]								
Dependent variable: EQUAL								
Regional characteristics								
TRUST_MINIS	−0.16	−0.57						
TRUST_DIET			−0.09	−0.24				
TRUST_MUNI					0.25	0.90		
SOUNDNESS							−0.007	−0.25
Dependent variable: TAX								
Regional characteristics								
TRUST_MINIS	0.006	0.01						
TRUST_DIET			0.46	1.03				
TRUST_MUNI					0.29	0.70		
SOUNDNESS							−0.05	−1.54
Log pseudo likelihood	−8,683		−8,682		−8,682		−8,682	
Observations	3,538		3,538		3,538		3,538	

[a] Values are coefficients. Numbers in parentheses are z-values calculated using robust standard errors clustered in the prefecture. In all estimations, constant and year dummies are included as independent variables but are not reported because of space limitations

*, **, and *** indicate significance at the 10, 5, and 1 % levels, respectively

[b] Values are coefficients. Numbers in parentheses are z-values calculated using robust standard errors clustered in the prefecture. In all estimations, control variables used in Table (a) are included as independent variables but are not reported because of space limitations

low-income earners can enjoy the benefit of income redistribution from high-income earners. Hence, the net social benefit from paying taxes is greater for low-income earners than for high-income earners. Furthermore, even if others evade tax owing to distrust toward the government, the tax burden does not outweigh the benefit for low-income earners. Hence, low-income earners are less inclined to oppose redistribution policies. In contrast, high-income earners are more likely to oppose redistribution and are therefore less inclined to prefer redistribution policies. Such conjecture is tested by dividing sample into roughly divided into two income level groups.

As shown in the upper part of Table 5(a), TRUST_MINIS, TRUST_DIET, TRUST_MUNI, and SOUNDNESS have the expected positive signs and are statistically significant in all estimations. The absolute values of the z-values are larger than those exhibited in Table 4 in each column. Furthermore, the coefficient values of TRUST_MINIS, TRUST_DIET, and TRUST_MUNI are 0.77, 1.24, and 0.91, respectively. The value of SOUNDNESS is 0.08. These values are approximately two times larger than those in Table 4. Compared with the full sample, trust level has a greater effect on EQUAL when the sample is limited to people with above average income. Therefore, Hypothesis 1 is strongly supported.

Looking now at the lower part of Table 5(a) and the key variables, the coefficient signs for TRUST_MINIS, TRUST_DIET, and TRUST_MUNI produce the expected negative signs, exhibiting statistical significance in all estimations. The absolute values of the coefficients of TRUST_MINIS, TRUST_DIET, and TRUST_MUNI are 0.72, 1.21, and 0.98, respectively. That for SOUNDENESS is 0.07. These values are larger than those in Table 4. Compared with the full sample, trust level has a greater effect on TAX when the sample is limited to those with above average income. The results of Table 5(b) are very similar to those in Table 5(a); therefore, the effect of trust in government on preference for redistribution policies and perceived tax burden is robust when an alternative subsample is used.[13] Thus, *Hypotheses* 1 and 2 are strongly supported when the sample is limited not only to those with above average incomes but also to those with incomes above the median.

As for control variables, the coefficients of AVINCOM are not statistically significant when TAX and EQUAL are used as dependent variables. In contrast, GINI yields the positive sign and is statistically significant when EQUAL is a dependent variable. However, the coefficient sign of GINI varies according to specifications and is not statistically significant when TAX is a dependent variable. The reason that the effect of GINI on preference for redistribution differs from that on perceived tax is partly explained by expressive behavior (Hillman 2010). The expressive voting hypothesis states that people vote for a certain policy despite the fact that the actual implementation of the policy would reduce their material utility. This is because individuals vote to express their views regarding particular issues, but they do not intend to affect the outcomes of the election (e.g., Tullock 1971; Copeland and Laband 2002; Sobel and Wagner 2004). Expressions of support for income redistribution by rich people can be considered as suggesting their support for the generosity of the welfare state, which increases the utility of rich people. However, expressing their perceptions regarding

[13] Other control variables are included as independent variables but are not reported. Their results are similar to those shown in Table 5(a). The results are available upon request to the author.

their tax burden is less likely to increase the utility of rich people. Estimations in the present paper have been based on survey data. Survey responses are likely to be interpreted as expressive because the responses do not affect redistribution policy in any way. That is, there is expressive utility from signaling conformity with group-defined norms of generosity regarding the welfare state but there is no material loss from expressing a preference for income redistribution (Tullock 1971).

Regarding individual characteristics, the results of INCOM are similar to those in Table 4, in the estimations of both EQUAL and TAX. The results of AGE and SCHOOL produce the positive and negative sign, respectively. Furthermore, they are statistically significant in the estimations of EQUAL, but not for TAX. One reason why AGE does not affect perceived tax burden could be that high-income earners save their income for a comfortable retirement, which leads them to perceive their tax burden as high. Regarding political views, the results are similar to those in Table 4 when TAX is a dependent variable. However, it is interesting to observe that when EQUAL is a dependent variable, the results are statistically insignificant in all columns. This implies that liberal people do not prefer redistribution policies if they are relatively rich.

4.3 Results based on sample of people with below average income

As shown in the upper part of Table 6(a), key variables related to trust in government are not statistically significant although TRUST_DIET, TRUST_MUNI, and SOUNDNESS have positive signs. Contrary to the prediction, these key variables have no influence on preference for redistribution. Therefore, Hypothesis 1 is not supported when the sample only contains people with below average income. As shown in the lower part of Table 6(a), trust-related variables have both negative and positive signs. TRUST_MINIS and SOUNDNESS have negative signs whereas TRUST_DIET and TRUST_MUNIS have positive signs, although they are not statistically significant. Surprisingly, these key variables have no effect on perceived tax burden. Therefore, Hypothesis 2 is not supported when the sample is limited to people with a below average income. The results of Table 6(b) are very similar to those in Table 6(a). Thus, the results in Table 6(a) and (b) imply that trust in government does not influence preferences for redistribution policies and perceived tax burden.

With respect to the control variables, the coefficient of AVINCOM yields the negative sign and is statistically significant at the 1 % level in all columns in the estimation of EQUAL. In contrast, AVINCOM is not statistically significant in the estimation of TAX. These results are similar to those in Table 4. The results of INCOM are similar for those in Table 4 when EQUAL is a dependent variable. However, there is one difference: when the dependent variable is TAX, INCOM has the negative sign, despite being statistically insignificant. Therefore, even when income level is relatively high within a low-income group, the income level does not reach the level where people perceive their tax burden as high. Both the estimations for EQUAL and TAX yielded the negative sign and were statistically significant. The estimation results for EQUAL are similar to those in Table 5(a). However, the estimation results for TAX differ from those in Table 5(a). This can be interpreted as implying the following: the higher an individual's education level, the more they will earn even if they currently belong to

a low-income group. Where the expected income is higher than the current income, low-income earners with higher education will perceive their current tax burden as low. In contrast, high-income earners have already enjoyed the returns from investments in human capital, and the probability that they will earn more in the future is low. Therefore, they do not perceive their tax burden as low. This is in line with the POUM hypothesis (Bénabou and Ok 2001; Alesina and La Ferrara 2005; Rainer and Siedler 2008). The positive signs of PROG_4 and PROG_5 are statistically significant when TAX is used as a dependent variable, and are similar to the results in Table 5(a). Furthermore, the statistically significant positive signs of PROG_4 and PROG_5 are observed when EQUAL is a dependent variable. This result differs from the results shown in Table 5(a). The results for political views in Tables 5(a) and (b) imply that liberal people are likely to prefer redistribution policies only when they belong to a high-income group. Therefore, the effect of political view on preference for redistribution policies changes according to which income group individuals belong.

To sum up the various estimated results presented thus far, the estimation results examined in this section are consistent with *Hypotheses* 1 and 2, and support them reasonably well when the full sample is used. However, these hypotheses continue to be supported only when the sample is restricted to people with relatively high incomes, and not when the sample is restricted to people with relatively low incomes.

5 Conclusions

Civic virtue and perception are found to influence the outcomes of economic policy and therefore the effectiveness of economic policy (Aghion et al. 2010; Algan and Cahuc 2009; Algan et al. 2011). However, the majority of previous studies on these issues are based on cross-country data or data from countries with heterogeneous populations. Hence, identifying the effect of perceptions such as trust is difficult. The present paper used data from Japan, a society considered as more racially and culturally homogenous than Western countries. Hence, the identification of the effect of trust is more convincing here than in previous research. The present paper examines the effect of trust in government on individual preferences for income redistribution and individual perceptions regarding income tax burden. The key findings are summarized as follows: people are more likely to express preferences for income redistribution and to perceive their tax burden as low when their neighbors are more inclined to trust government. When the sample is divided into people with above average income and below average income, these results are only clearly observed for people with above average income and not for those with below average income.

The main contribution of the present paper is twofold: First, the effect of trust in government on views regarding the welfare state varies according to income group even when respondents share the same cultural and historical background. Algan et al. (2011) assumed that individuals are categorized into two types, either civic or uncivic, in an attempt to explain the non-monotonic relationship between trust and generosity of welfare states. However, in their regression estimations to explore the determinants of generosity of welfare states, the difference between civic and uncivic individuals

was not directly assessed. The present paper, following existing works (Alesina et al. 2004; Yamamura 2012b; Dahlberg et al. 2012), sheds light on differences in income levels to investigate how trust in government affects perceptions regarding the welfare state. The present paper shows clear differences between people with above average income and those with below average income. Second, considering the determinants for preference for redistribution and perceived tax burden established that trust has a more systematic effect on perceptions regarding the welfare state than those suggested in existing literature.

According to the estimation results based on the full sample, SCHOOL shows a significant negative effect when both preference for redistribution and perceived tax burden are examined. Furthermore, there was a difference between the estimations for people with higher levels of education and those with lower levels. It also seems possible that there is a gender difference between the estimation results. Therefore, it would be worthwhile to compare results between people with high and low levels of education and between males and females. As mentioned above, Japan is generally characterized as a racially homogenous society. Aside from such homogeneity, Japan's historical and cultural backgrounds also distinguish it from Western countries. Therefore, to test the generality of these findings, it is necessary to examine the hypotheses proposed in this paper using other countries with different characteristics. For instance, Anglo-Saxon countries such as the United States show a medium level of trust and low generosity from the welfare state, which is similar to Japan. However, the United States is regarded as a distinctly heterogeneous society. Hence, it is worthwhile testing the hypothesis of the present paper using data from the United States, and to then compare those results with the present paper. These are remaining issues that can be addressed in future studies.

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