Time preference and perceptions about government spending and tax: Smokers' dependence on government support

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25 March 2014

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Abstract

Previous studies show that smokers are likely to be more impatient and prefer immediate benefits compared with non-smokers. Thus, smokers are regarded as myopic people and therefore have a high time discount rate. Such a tendency is thought to be related not only to short-term benefits (as opposed to long-term benefits), but also free-riding behavior. Using individual data, this paper examines which types of government spending smokers with such characteristics prefer. The important findings are: (1) smokers consider the amount of government spending on social security and unemployment measures to be low and (2) smokers perceive their tax burden to be high. These findings imply that smokers tend to place greater importance on public expenditure that they will personally benefit from, but they are less willing to bear its cost. It is inferred from the estimation results that those who are myopic do not consider long-term benefits, which can result in a number of personal problems in the future, and they anticipate government expenditure will help them with such problems. That is, to enjoy the benefit of free riding, seemingly myopic people are more likely to prefer expenditure on social security and unemployment measures.

1. Introduction

In policy making, it is important to understand the motivation behind individuals' preferences for specific government spending. Based on cost–benefit analysis, policy makers evaluate each project and can then calculate the optimum level of allocation of government spending. There already exist a number of empirical studies on individual preferences for public spending. Based on survey data, classical studies have been conducted that largely examine the influence of economic factors on the willingness to pay for specific government projects (e.g., Strauss and Hughes 1976; Hockley and Harbour 1983; Ferris 1983, 1985; Schokkaert 1987). More recently, to closely examine the individual demand for public spending, economic researchers have taken into account not only traditional economic factors, but also psychological factors (Delaney and O'Toole 2007, 2008). Delaney and O'Toole (2007) suggest that perceptions regarding welfare cheating are negatively associated with the preference for social welfare spending. To systematically analyze how people perceive the cost and benefit of public goods, it is also necessary to explore individual attitudes towards tax. An individual's perceptions regarding tax is closely related to their preference for government spending. This matter has been empirically explored in numerous studies (e.g., Cuccia and Carnes 2001; Gemmell et al., 2003; Feld and Larsen 2012; Oh and Hong 2012).

Recent studies by psychological and behavioral economic researchers provide various findings concerning time preferences and attitudes towards risk, which are considered key factors to determine individual behavior (Ikeda et al. 2010; Ikeda 2012; Kang and Ikeda 2014). For instance, time preference is closely related to the levels of tax, gambling, and obesity (Ikeda 2012). However, existing studies do not consider how time discounting is related to preferences for government spending and the perceived tax burden. To closely examine individual perceptions of government spending and tax, this paper deals with the determinants of specific government spending as well as the perceived tax burden by focusing on individual time preferences.[1] The goal of this paper is to bridge public economics and psychological (behavioral) economics to consider how individual time preference affects public finance.

It seems appropriate to argue that impatient and myopic people attach greater

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[1] Yamamura (2014a) provides evidence that trust in government by residential area is negatively associated with the individual's tax burden.

importance to the current benefit than the future benefit. In other words, they tend to enjoy the short-term benefit at the expense of the long-term benefit. Thus, individuals' time preferences are considered to affect their decision making. A number of empirical studies provide evidence that smokers are more impatient than non-smokers and are more present-oriented (e.g., Sato and Ohkusha 2003; Khwaja et al. 2006a, 2006b; Ida and Goto 2009a, 2009b; Harrison et al. 2010). Smokers tend to be less patient when making choices for the immediate future compared with those for the distant future (Kang and Ikeda 2014). The fact that an individual's discount rate is reflected in smoking behavior is useful to investigate how an individual with a high discount rate behaves and perceives in the real world. That is, whether or not people smoke can be used as a proxy for their discount rate (Munashinghe and Sicherman 2006).[2]

In this paper, following the arguments of Munasinghe and Sicherman (2006) and Yamamura (2014b), a smoking dummy is used as a proxy for a high discount rate. For this purpose, individual-level data from the Japanese General Social Survey (JGSS) is used because it includes information on smoking, perceived tax burden, and subjective evaluations about various types of government spending. The major finding of the present study is that those who are impatient tend to consider that there is insufficient government spending on social security and unemployment measures. This indicates that they demand greater amounts of government spending on social security and unemployment measures.

The remainder of this article is organized as follows. Section 2 presents the testable hypotheses. Section 3 describes the data and empirical method used. In Section 4, the empirical method and estimation results are exhibited. The final section provides some conclusions.

2. Hypotheses

The rest of one's life is clearly expected to be longer for young people than old people, and therefore this produces different incentives between the young and the old when evaluating government spending. Assuming people rationally pursue self-interest, the young are more likely to evaluate government spending from a long-term perspective than older people. For instance, people will only enjoy the benefit of government spending on education if the return from education is

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[2] Previous studies have examined how smoking is associated with economic outcomes such as wage rate, use of seatbelts, and experience of injury (e.g., Hersch and Visvusi 1990; Hersch 1996; Levine et al. 1997; Viscusi and Hersch 2001).

reflected in an increase in earnings through the accumulation of human capital. That is, it takes a long time for taxpayers to enjoy the outcome of such spending. Therefore, people are required to have a reasonable life span and be patient to gain the returns from education. In contrast, people can immediately enjoy the benefit of government spending on pensions and health-care services. The time lag between such spending and its outcome is small. Therefore, this type of government spending is useful even for those who are impatient and are nearing the end of their lives. All other things being equal, the young demand greater government spending on education, while older people demand greater government spending on social welfare (Sorensen 2013). This shows the possibility that time preferences vary according to age.

A similar argument also holds true between smokers and non-smokers, which is inferred from empirical evidence regarding the difference between the two groups in terms of time preference (e.g., Sato and Ohkusha 2003; Khwaja et al. 2006a, 2006b; Harrison et al. 2010). Smokers have a high time discount rate and are therefore regarded as more impatient than non-smokers. Smokers also tend to drink alcohol and gamble heavily (Ida and Goto 2009a; 2009b).[3] Therefore, smokers are inclined to incur debt and this eventually leads to financial ruin (Ikeda 2012). Social security and unemployment measures are valuable for those who have experienced such problems. Thus, one can argue that "seemingly myopic" people behave impatiently because they anticipate that they can enjoy public support even after their failures in the future. That is, spending on social security and unemployment measures cause the moral hazard problem of seemingly myopic people. Rational but present-oriented people have an incentive to demand greater spending to support them in the future in their times of need. Accordingly, I raise *Hypothesis 1.*

Hypothesis 1:
Smokers are more likely to demand government spending to support those who are in dire financial circumstances.

Even though rational and seemingly myopic people benefit from government

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[3] To put it more precisely, smokers tend to be characterized as having a low level of patience. Thus, smokers have a hyperbolic time discount rate (Kang and Ikeda 2014). Low patience is defined as being less patient when making immediate future choices compared with distant future choices, and is thought to result in overconsumption and over-borrowing (Laibson 1997; Laibson et al. 2007).

spending on social security and unemployment measures, if they themselves have to bear the expense, then the amounts of spending are thought to be at the optimum level. In other words, seemingly myopic people adhere to the principle that "the beneficiary pays". However, a problem arises when people demand such spending but do not bear the cost. There is the possibility that present-oriented people strategically behave myopically by anticipating social security in the future. Furthermore, they do not intend to bear the expense of such spending. In this case, the problem of the free rider arises. For those who are willing to enjoy free ridding, the tax burden is considered high. Here, *Hypothesis 2* is postulated.

Hypothesis 2:
Smokers tend to perceive the tax level as high.

3. Data

JGSS data is used for the empirical analysis in this paper. To collect JGSS data, a two-stage stratified sampling was used.[4] The respondents were adults aged 18 years and older. The JGSS included various questions concerning individuals' characteristics using face-to-face interviews. Hence, from the JGSS, I was able to source data concerning smoking behavior, marital and demographic (age and sex) status, annual household income,[5] years of schooling, political views, and health status. Furthermore, information regarding individuals' perceptions about tax burden and specific government spending for seven categories were available. JGSS surveys have been conducted throughout Japan since 2000, with the most recent carried out in 2012. However, data on perceptions about government spending were only collected in 2000, 2001, 2003, and 2006. Therefore, the JGSS dataset used in this study only covers 2000, 2001, 2003, and 2006.

The definitions of the variables used in the regression estimations are shown in Table 1. The key dependent variables are *Tax burden* and various kinds of government spending such as that on social security and pensions (*Social*), employment and unemployment measures (*Employment*), crime reduction (*Crime*),

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education (*Education*), public works projects such as road construction and river control (*Construction*), environmental issues (*Environment*), and foreign aid (*AID*). One question in the JGSS concerning *Tax burden* asked, "Do you think the amount of income tax you have to pay is high?" There are five response options, ranging from 1 (too low) to 5 (too high). *Tax burden* represents the value of the respondents' responses.

Concerning government spending, respondents were asked, "What do you think of the amount of government spending in the following areas?" For each type of spending, there are three response options ranging from 1 (too little) to 3 (too much). *Social* is the value of the respondents' responses with respect to spending on social security and pensions. A lower *Social* value (the same is true for *Employment, Crime, Education, Construction, Environment*, and *AID*) will show that respondents consider government spending on social security and pension as insufficient. This can be interpreted to mean that respondents demand greater amounts of government spending in these areas.

Table 1 shows that values of *Social* is 0.9 points smaller for smokers than non-smokers, while that of *Employment* is 0.7 points smaller for smokers than non-smokers. This implies that spending on social security, pensions and unemployment measures are not perceived to be sufficient for smokers compared with non−smokers. In addition, there is not a significant difference in government spending between smokers and non−smokers. Turning to *Tax burden,* its value is 0.9 points larger for smokers than non−smokers, indicating that smokers perceive the tax burden as higher than non−smokers. These results are in line with Hypotheses 1 and 2.

For a closer look into the differences between the perceptions of smokers and non-smokers about government spending and tax burden, a regression estimation is used.

4. Estimation method and results

4.1. Econometric framework

For the purpose of exploring how time preference influences perceptions about specific government spending, the estimated function is as follows:

$$Y_i = \alpha_0 + \alpha_1 Smoker_i + \alpha_2 Income_i + \alpha_3 Age_i + \alpha_4 Married_i + \alpha_5 Child_i + \alpha_6 Schooling_i + \alpha_7 Unemployed_i + \alpha_8 Male_i + \alpha_9 Health_i + \alpha_{10} Progressive_i + u_i,$$

where Y_i represents the dependent variable for individual i such as *Social,*

Employment, *Crime*, *Education*, *Construction*, *Environment*, and *AID*. Regression parameters are represented by α. The error term is represented by u_i. There are seven equations because there are seven different dependent variables. If a correlation exists between the residuals of different equations, then a seemingly unrelated regression (SUR) model is appropriate (Greene 2008). Delaney and O'Toole (2007) attempted to ascertain the determinants of individuals' preferences for government spending on social welfare, heath, and education. They also conducted a similar estimation (Delaney and O'Toole 2008) using different dependent variables. Assuming a correlation between equations, Delaney and O'Toole (2007, 2008) used a SUR model. This paper also uses a SUR model to examine perceived government spending for seven categories.

During the study period, macroeconomic conditions in Japan experienced various exogenous shocks. Macroeconomic shocks are expected to affect an individual's perceptions about government spending. Therefore, to include macroeconomic shocks, this study included year dummies. The amount of government spending for each project differs according to local government where respondents reside, which inevitably influences perceptions regarding government spending. In addition, various unobservable regional specific factors are thought to influence perceptions. JGSS data also contains information about the prefectures where the respondents live.[6] Hence, prefecture dummies are incorporated to control for these effects.

In this specification, to examine *Hypothesis 1,* Smoking is considered the key variable. Smokers prefer current benefits at the expense of any future benefits, meaning that in the future, smokers are more likely to experience reduced financial circumstances. The coefficient of *Smoker* is predicted to be negative when the dependent variable captures spending to support those in reduced circumstances. Among the dependent variables, *Social* and *Employment* are considered to support such individuals. Thus, it is predicted that the coefficient of *Smoker* is negative if *Social* and *Employment* are the dependent variables.

Following previous research (e.g., Hockley and Harbour 1983; Ferris 1983 1985; Schokkaert 1987; Delaney and O'Toole 2007, 2008), various socioeconomic factors are taken into account by incorporating various variables. *Income* and *Unemployed* are incorporated to capture economic condition effects. People with

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[6] A Japanese prefecture is considered the equivalent of a state in the United States or a province in Canada. Therefore, spatial correlation was assumed to be unique within the prefecture.

higher earnings are less likely to demand government support while unemployed people are more likely to. Therefore, where *Social* and *Employment* are dependent variables, *Income* and *Unemployed* are predicted to be positive and negative, respectively. The degree of education level captured by *Schooling* is considered to affect time preference and is also included. Older people typically demand greater government spending on social welfare (Sorensen 2013). Therefore, *Age* is predicted to be negative when *Social* and *Employment* are dependent variables. It has also been found that females are more likely than males to consider growth in social welfare spending important (Funk and Athmann 2008) and to support left-wing policies (Edlund and Pande 2002).[7] To capture this, *Male* is included. Based on the findings of earlier studies (Funk and Athmann 2002; Edlund and Pande 2002), it is predicted that the coefficient of *Male* will be positive when *Social* and *Employment* are dependent variables. If people have young children, they support greater government spending on education because education produces an accumulation of human capital and in turn their child will earn higher earnings in the future. Parents are thought to hope that their child will become rich. Hence, *Child* is predicted to be negative when *Education* is the dependent variable.

Smoker is thought to capture not only individuals' preferences, but also their health status because smoking behavior can have a detrimental effect on health status. Therefore, smokers are thought to have poorer health than non-smokers and demand spending on social security even if the time discounting of smokers is not related to demands for spending. Hence, to identify the effect of smoking, the function includes dummies for health status (*Health_2*, *Health_3*, *Health_4*, *Health_5*), where *Health_1* is the reference group. Furthermore, one's political view may determine the demand for specific government spending. People with progressive views are thought to prefer social security, unemployment measures, and be interested in environmental issues. Accordingly, this paper incorporates dummies for political view (*Progressive_2*, *Progressive_3*, *Progressive_4*, *Progressive_5*), where *Progressive _1* is the reference group. These dummies are predicted to be negative when the dependent variable is either *Social, Employment,* or *Environment.*

In addition to estimations for government spending, to assess *Hypotheses 2*, the dependent variable *Tax Burden* is also included in the SUR model. From

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[7] It is acknowledged in quantitative historical work that women's suffrage has had a critical influence on the size of government and the allocation of public spending (e.g., Aidt and Dallal 2008; Lott and Kenny 1999; Miller 2008).

Hypothesis 2, *Smoker* is predicted to be positive. Apart from health status and *Child,* the control variables used in this paper are also incorporated as independent variables to examine the perceived tax burden stated in the existing literature (Yamamura 2014a).

4.2.   Results

The results of government spending estimations are reported in Tables 2, 3 and 4. The results of the full model are reported in Table 2. Tables 3 and 4 show results excluding some control variables. In each table, columns (1)–(7) present results when government spending for specific projects is a dependent variable; column (8) exhibits results when *Tax burden* is a dependent variable. According to the specifications, the number of observations differs because data regarding some independent variables were not available for some observations.

4.2.1. Estimation results for Government spending

With respect to the results of Tables 2, 3 and 4, a Breusch-Pagan test of independence between residuals yields a chi-squared coefficient of 1,394, 1,940, and 2,021, respectively. These suggest that the residuals are not independent and that a SUR model is more appropriate than the ordinary least squares method.

Columns (1) and (2) in Table 2 show results when the dependent variables are *Social* and *Employment*, respectively. In columns (1) and (2), the coefficient for *Smoker* is negative and statistically significant at the 1 percent level. Hence, smokers tend to perceive government spending on social security, pensions, and unemployment measures as low. This can be interpreted as implying that impatient people consider government spending for these projects as insufficient and therefore demand greater spending. That is, the results of *Smoker* concerning *Social* and *Unemployment* are consistent with *Hypothesis 1.* Furthermore, the absolute values of the coefficients of *Smoker* in columns (1) and (2) are 0.09 and 0.10, respectively. Smokers perceive spending on social security and pensions to be 0.09 points lower on the 3-point scale compared with non-smokers, while smokers perceive spending on unemployment measure to be 0.10 points lower compared with non-smokers. This is interpreted as a sufficiently sizable effect.

Column (8) shows the result when the dependent variable is *Tax burden.* The coefficient of *Smoker* is positive and statistically significant, suggesting that smokers tend to perceive the tax burden as high. This is in line with *Hypothesis 2.* Furthermore, the absolute value of the coefficient of *Smoker* in column (8) is 0.07.

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Smokers perceive the tax burden to be 0.07 points higher on the 5-point scale compared with non-smokers.

Concerning the results of the control variables, *Male* is positive and significant in columns (1) and (2). Furthermore, its absolute values in columns (1) and (2) are 0.08 and 0.11, respectively. These results show that gender has a sizable effect on evaluations about public spending for *Social* and *Employment*, which is congruent to the arguments in existing research (Edlund and Pande 2002; Funk and Athmann 2008). In addition, with respect to political view, *Progressive_2, Progressive_3 Progressive_4*, and *Progressive_5* are negative and *Progressive_3* and *Progressive_4* are statistically significant. This indicates that those who have progressive views tend to perceive government expenditure for *Social* and *Employment* as low. This is in line with the intuition.

Column (3) shows results when *Crime* is the dependent variable; *Income* and *Age* are negative and statistically significant. People with higher earnings are more likely to be the targets of crime such as burglary or robbery. Furthermore, it is difficult for aged people to protect themselves against crime. It is for these reasons that high earners and older people perceive government spending on crime reduction as low and therefore demand greater spending.

With *Education* as the dependent variable, column (4) shows *Married* and *Schooling* to be negative and statistically significant at the 1 percent level. My interpretation of these results is as follows. The result of *Married* reflects that married people are more likely to have child(ren) and so demand greater government spending on education for their child(ren). In my conjecture, even though *Child* is included, such an effect is not sufficiently disentangled from *Married.* Educated people think highly of schooling because they know that the return from schooling is sufficiently large and therefore they demand greater government spending on education.

Column (5) shows the results of *Construction*. Construction work is mainly based on physical labor, which benefits low-educated people. This might be why *Schooling* is positive and statistically significant. In Japan, rent-seeking behavior in the construction industry is considered to contribute to increase government expenditure in the construction industry (Yamamura and Kondoh 2013). There is collusion between politicians, bureaucrats, and business leaders in Japan. Progressive-thinking people are reasonably inclined to criticize structural collusion. This might explain why *Progressive_4* and *Progressive_5* are significant and positive. In contrast with *Construction*, as reported in column (6) with

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Environment as the dependent variable, *Schooling, Progressive_2, Progressive_3 Progressive_4*, and *Progressive_5* are negative and significant. Educated and progressive-minded people are more likely to consider environmental issues as important (e.g., Dastrup et al. 2012; Costa and Kahn 2013a, 2013b; Cragg et al. 2013). This might lead educated and progressive-minded people to demand greater government spending on environmental issues, which is consistent with the results in column (6).

For robustness checks of the results concerning *Hypotheses 1* and *2*, Tables 3 and 4 exhibit the results for *Smoker*, regarded as the key variable to examine the hypotheses. This paper reported the results of alternative specifications where some variables were excluded from the specification reported in Table 2. In the alternative specifications, sample size naturally increases because respondents who did not answer the questions used in the specification in Table 2 are included in the alternative specifications. Thus, in these estimations, respondents are not restricted as were the estimations of Table 2. In Tables 3 and 4, the coefficients of *Smoker* continue to be negative and statistically significant in columns (1) and (2), whereas that of *Smoker* continues to be positive and statistically significant in column (8). Tables 3 and 4 suggest the results of *Smoker* are robust to alternative specifications. The combined results of Tables 2–4 strongly support *Hypotheses 1* and *2*. Furthermore, column (7) in Tables 3 and 4, where the dependent variable is *AID*, shows *Smoker* to be positive and significantly positive, indicating that smokers perceive government spending on foreign aid as too high. Foreign aid does not improve the situation of domestic populations; this is despite the fact that such aid is thought to contribute to improve international relationships between Japan and donee nations. The results for government spending on foreign aid reflect that smokers demand government spending that will offer them direct and immediate benefits.

The estimation results show the following: (1) smokers consider government spending on social security and unemployment measures to be low although such a tendency is not observed for government spending on other projects such as crime, education, public works, environment issues, and foreign aid; (2) smokers perceive the burden of tax to be high. From this, I derive the argument that people with a high time discount rate tend to rely on government support and therefore demand greater spending on social security, pensions, and unemployment measures, and are not willing to bear the expense for such spending. That is, people characterized by impatience possibly exhibit present-oriented behavior in the short term by

anticipating government support in the future at the expense of other citizens. Seemingly myopic people pursue short-term benefits and rely on government support in the future. In other words, government spending on security, pensions, and unemployment gives people with higher time discount rates a greater motivation to become free riders. Thus, there is the possibility that myopic people prefer policies that trigger the moral hazard problem.

5. Conclusions

Those who are impatient and myopic seem to prefer short-term benefits rather than long-term ones. In other words, impatient and myopic people are considered to enjoy current benefits at the expense of future benefits. This holds true if political processes and the influence of government on economic outcomes are not considered. However, in the real world, government plays a role in providing public goods, which possibly changes individual behavior. Thus, it is important to analyze the relationship between individual time discounting and moral hazard when economic policy is considered. Despite the importance of this issue, it has not been sufficiently addressed by existing research. Therefore, this paper attempted to investigate how myopic people perceive government spending and their tax burden by bridging behavioral economics and political economy.

The major findings of this paper are: (1) smokers consider government spending on social security and unemployment measures to be low and (2) smokers perceive the burden of tax to be high. These imply that smokers tend to assign greater importance to expenditure that enables them to personally enjoy the benefit of public support, but they are less willing to bear its expense. It is inferred from the estimation results that impatient people behave myopically and are therefore more likely to experience personal problems in the future, while also anticipating that government expenditure will help them. The results of this paper suggest that myopic people prefer policies that enable them to enjoy its benefit in the future, which triggers the moral hazard problem. The moral hazard problem is serious if myopic people form a special interest group for their long-term benefit.

The JGSS data used in this paper does not include information that directly measures individual time discount rate. To address this issue, this paper treats the smoking dummy as a proxy for impatience, regarded as high time discounting; this assumption is very strong. Some control variables appear to be correlated with the time discount rate even if a smoking dummy is incorporated. The reason for this is

that the time discount rate cannot be directly observed and is included in the error term. Inevitably, a correlation between the error term and independent variable leads to endogenous bias. When this occurs, a variable should be used to directly measure the time discount rate for a closer examination of the relationship between time preference and perceptions of government spending and tax burden. This is an issue that remains to be addressed in future work.

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	Definitions	Smokers	Non-smokers
Social	Perceptions regarding amount of government spending on social security and pensions. Question in questionnaire: *What do you think of the amount of government spending in the following areas?* There are three response options: 1 (too little)–3 (too much).	1.34	1.43
Employment	Perceptions regarding amount of government spending on employment and unemployment measures. Question in questionnaire: *What do you think of the amount of government spending in the following areas?* There are three response options: 1 (too little)–3 (too much).	1.31	1.38
Crime	Perceptions regarding amount of government spending on crime reduction. Question in questionnaire: *What do you think of the amount of government spending in the following areas?* There are three response options: 1 (too little)–3 (too much).	1.46	1.47
Education	Perceptions regarding amount of government spending on education. Question in questionnaire: *What do you think of the amount of government spending in the following areas?* There are three response options: 1 (too little)–3 (too much).	1.58	1.57
Construction	Perceptions regarding amount of government spending on public works projects such as road construction and river control. Question in questionnaire: *What do you think of the amount of government spending in the following areas?* There are three response options: 1 (too little)–3 (too much).	2.36	2.35
Environment	Perceptions regarding amount of government spending on environmental issues. Question in questionnaire: *What do you think of the amount of government spending in the following areas?*	1.43	1.45

	There are three response options: 1 (too little)–3 (too much).		
Tax burden	Degree of perceived tax burden Question in questionnaire: *Do you think the amount of income tax you have to pay is high?* There are five response options: 1 (too low)–5 (too high). *Tax burden* is the value of the respondents' responses.	4.25	4.16
AID	Perceived amount of government spending for Foreign aid. Question in questionnaire: *What do you think of the amount of government spending in the following areas?* There are three response options: 1 (too little)–3 (too much)s	2.44	2.39
Smoker	The value is 1 if the respondent is currently a smoker, otherwise 0.	–––	–––
Income	Individual household income (million yen)	7.15	7.52
Age	Age (years)	47.8	51.7
Married	The value is 1 if the respondent is currently married, otherwise 0.	0.80	0.83
Child	The value is 1 if the respondents have a child below 6 years old.	0.15	0.08
Schooling	Years of schooling	12.6	12.7
Unemployed	The value is 1 if the respondent is currently unemployed, otherwise 0.	0.01	0.01
Male	The value is 1 if the respondent is male, otherwise 0.	0.81	0.54
Progressive_1	Concerning political views, it takes 1 if respondents choose 1, otherwise 0. 1 (conservative)–5 (progressive)	0.08	0.09

Progressive_2	Concerning political views, it takes 1 if respondents choose 2, otherwise 0. 1 (conservative)–5 (progressive)	0.20	0.23
Progressive_3	Concerning political views, it takes 1 if respondents choose 3, otherwise 0. 1 (conservative)–5 (progressive)	0.41	0.42
Progressive_4	Concerning political views, it takes 1 if respondents choose 4, otherwise 0. 1 (conservative)–5 (progressive)	0.24	0.21
Progressive_5	Concerning political views, it takes 1 if respondents choose 5, otherwise 0. 1 (conservative)–5 (progressive)	0.06	0.04
Health_1	Concerning health condition, it takes 1 if respondents choose 1, otherwise 0; 1 (poor)–5 (good).	0.05	0.06
Health_2	Concerning health condition, it takes 1 if respondents choose 2, otherwise 0; 1 (poor)–5 (good).	0.13	0.15
Health_3	Concerning health condition, it takes 1 if respondents choose 3, otherwise 0; 1 (poor)–5 (good).	0.36	0.33
Health_4	Concerning health condition, it takes 1 if respondents choose 4, otherwise 0; 1 (poor)–5 (good).	0.23	0.24
Health_5	Concerning health condition, it takes 1 if respondents choose 5, otherwise 0; 1 (poor)–5 (good).	0.22	0.23

Sample is used for baseline estimations presented in Table 2.

Table 2 Seemingly unrelated regression (SUR) estimation where the dependent variable is government spending

	Government spending							Tax burden
	(1) Social	(2) Employment	(3) Crime	(4) Education	(5) Construction	(6) Environment	(7) AID	(8)
Smoker	−0.09*** (−3.15)	−0.10*** (−3.55)	−0.02 (−0.84)	0.003 (0.11)	0.01 (0.40)	−0.001 (−0.05)	−0.05 (1.51)	0.07* (1.66)
Income	0.02 (0.80)	0.06* (1.90)	−0.06* (−1.78)	−0.03 (−0.96)	0.04 (1.11)	−0.03 (−0.97)	−0.06* (−1.70)	0.12** (2.30)
Age	0.001 (0.48)	−0.001 (−0.90)	−0.002** (−2.12)	0.001 (1.34)	−0.001 (−1.20)	−0.001 (−0.83)	0.005*** (3.73)	−0.01*** (−2.84)
Married	−0.06 (−1.48)	−0.04 (−1.07)	−0.02 (−0.65)	−0.14*** (−3.60)	0.04 (0.88)	−0.08** (−2.02)	0.01 (0.43)	0.07 (1.25)
Child	−0.03 (−0.71)	−0.01 (−0.27)	0.01 (0.25)	−0.03 (−0.68)	0.02 (0.40)	−0.01 (−0.18)	0.03 (0.58)	−0.10 (−1.38)
Schooling	−0.01 (−1.60)	−0.002 (−0.49)	−0.01 (−1.58)	−0.02*** (−3.84)	0.03*** (4.09)	−0.04*** (−7.35)	−0.004 (−0.66)	−0.01** (−1.68)
Unemployed	−0.07 (−0.65)	−0.15 (−1.40)	−0.17 (−1.60)	0.09 (0.85)	0.10 (0.78)	−0.01 (−0.08)	0.15 (1.15)	−0.02 (−0.15)
Male	0.08*** (2.78)	0.11*** (3.73)	−0.002 (−0.00)	0.05* (1.76)	−0.02 (−0.72)	−0.06** (−2.26)	0.05 (1.50)	−0.04 (−0.95)
Progressive_1				<Reference group>				
Progressive_2	−0.04 (−0.69)	−0.06 (−1.07)	−0.01 (−0.14)	0.05 (0.85)	0.05 (0.69)	−0.10* (−1.83)	0.09 (1.42)	0.08 (0.92)
Progressive_3	−0.12** (−2.08)	−0.14** (−2.54)	0.05 (1.01)	0.05 (0.89)	0.10 (1.47)	−0.12** (−2.18)	0.06 (0.96)	0.23*** (2.73)
Progressive_4	−0.15** (−−2.57)	−0.15** (−2.54)	0.03 (0.59)	−0.07 (−1.20)	0.21*** (2.89)	−0.23*** (−3.82)	0.09 (1.33)	0.19** (2.18)

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Progressive_5	−0.10	−0.04	−0.05	−0.09	0.29***	−0.23***	0.21**	0.38***
	(−1.34)	(−0.63)	(−0.65)	(−1.21)	(2.96)	(−2.93)	(2.32)	(3.15)
Health_1				<Reference group>				
Health_2	0.004	−0.15*	−0.18**	−0.09	0.15	−0.17**	0.23**	−0.02
	(0.05)	(−1.84)	(−2.27)	(−1.12)	(1.42)	(−2.05)	(2.37)	(−0.19)
Health_3	0.05	−0.05	−0.05	−0.02	0.07	−0.07	0.23**	0.01
	(0.75)	(−0.75)	(−0.71)	(−0.30)	(0.70)	(−0.97)	(2.55)	(0.06)
Health_4	0.07	−0.03	−0.08	−0.02	0.11	−0.10	0.27***	−0.06
	(0.86)	(−0.44)	(−1.05)	(−0.25)	(1.17)	(−1.30)	(2.87)	(−0.55)
Health_5	0.16**	0.03	−0.02	0.03	0.11	−0.09	0.21**	−0.05
	(2.03)	(0.48)	(−0.34)	(0.48)	(1.09)	(−1.09)	(2.22)	(−0.42)
R−square	0.08	0.07	0.07	0.07	0.09	0.12	0.06	0.06
Observations	1664	1664	1664	1664	1664	1664	1664	1664

Notes: Numbers in parentheses are z−statistics. *, **, and *** indicate significance at the 10, 5, and 1% levels, respectively. In all estimations, constant, prefecture dummies, and year dummies were included as independent variables.

Table 3. Seemingly unrelated regression (SUR) estimation where the dependent variable is government spending: *Child* and Dummies for health status are deleted from the set of independent variables shown in Table 2.

	Government spending							Tax burden
	(1) Social	(2) Employment	(3) Crime	(4) Education	(5) Construction	(6) Environment	(7) AID	(8)
Smoker	−0.07*** (−2.87)	−0.06** (−2.48)	−0.01 (−0.73)	0.01 (0.56)	0.01 (0.42)	0.01 (0.68)	0.07** (2.42)	−0.09** (−2.31)
R-square	0.06	0.06	0.05	0.06	0.09	0.10	0.05	0.05
Observations	2193	2193	2193	2193	2193	2193	2193	2193

Notes: Numbers in parentheses are z-statistics. ** indicates significance at the 5% level.

Table 4. Seemingly unrelated regression (SUR) estimation where the dependent variable is government spending: *Child* and dummies for health status and those for political position (progressiveness) are excluded from the set of independent variables shown in Table 2.

	Government spending							Tax burden
	(1) Social	(2) Employment	(3) Crime	(4) Education	(5) Construction	(6) Environment	(7) AID	(8)
Smoker	−0.08*** (−3.16)	−0.07*** (−2.72)	−0.01 (−0.57)	0.01 (0.59)	0.01 (0.42)	0.01 (0.62)	0.06** (2.33)	0.11*** (2.85)
R-square	0.03	0.05	0.05	0.05	0.04	0.08	0.08	0.05
Observations	2275	2275	2275	2275	2275	2275	2275	2275

Notes: Numbers in parentheses are z-statistics. ** and *** indicate significance at the 5 and 1% levels, respectively.