Elderly Poverty Issues and Trade Policy Preferences: Evidence from a Survey Experiment in Japan

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Abstract

The recent backlash against globalization in many countries has raised questions about the source of this protectionist sentiment and rekindled the long-standing debate over the determinants of citizens' trade policy preferences. We examine the influence of two understudied but increasingly relevant factors—the salience of population aging-related issues and regional demographic structure—on individuals' support for trade in Japan. Using the original Japanese survey experiment data, we first show that elderly people are less likely to support import restrictions. We then find that the salience of aging-related issues can mitigate the impact of age on trade preferences. In aged prefectures with population aging rapidly, elderly people are more likely to support import restrictions, and more so if they are exposed to the elderly poverty issue from a producer perspective. The results indicate that in the face of a rapidly aging society, the elderly are pushed back to the labor market competing for low-paid and low-skill jobs and thus concerned more than ever about the employment volatility that also accompanies trade liberalization. This study has important implications for trade policy choices in an aging society by offering new predictors of individuals' preferences regarding trade protection.[†]

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1 Introduction

The rapid population aging is one of the major global demographic trends. According to the United Nations, the global population aged 60 years or over numbered 962 million in 2017, more than twice as large as in 1980. The number of the elderly is expected to double again by 2050, when it is projected to reach nearly 2.1 billion (United Nations 2017). Population aging is not merely an increase in the number of older citizens; it is a socio-economic transformation wherein this demographic change generates a new class—namely, elderly workers. It also induces changes in consumption patterns. For instance, the elderly tend to consume more services than the young. Hence, population aging can have important impact on trade patterns and preferences. Despite its deep implications, there is a small body of literature that links the demographic change with international trade.

Furthermore, the recent backlash against globalization in many countries has raised questions about the source of this protectionist sentiment and rekindled the long-standing debate over the determinants of citizens' trade policy preferences. It is difficult to explain trade policy preferences only by conventional economic factors, such as industry, occupation, and skill, as reported by previous research (e.g., Blonigen 2011; Mayda and Rodrik 2005; Scheve and Slaughter 2001). In this study, we examine the influence of two understudied but increasingly relevant factors—the salience of population aging-related issues and regional demographic structure—on individuals' support for trade in Japan.

The impact of age on trade policy preferences is under-theorized and existing empirical studies provide mixed evidence. Age appears to be significantly associated with support for protection among individuals in several studies (e.g., Ehrlich and Maestas 2010; Kaltenthaler et al. 2004; Mansfield and Mutz 2009; Mayda and Rodrik 2005; O'Rourke and Sinnott 2001; Rho and Tomz 2015; Tomiura et al. 2016), while it is not in others (Beaulieu 2002; Scheve and Slaughter 2001). In addition, in terms of the direction of the effect, age can arguably affect trade preferences in two opposite ways. On the one hand, for instance, Tomiura et al. (2016) assert that people over

1

retirement age are more likely to favor freer imports, since their policy preferences are no longer formed as producers or workers, but as consumers. Most consumption by the elderly incurs on services such as health care, leisure and recreation that cannot be imported (Chisik et al. 2016). Hence, people older than retirement age are less likely to be protectionist than the working-age population. On the other hand, more commonly, scholars have focused on the benefits of trade related to individuals' roles as producers of goods and services that are affected by trade policy. In the face of growing threats to cut pension benefits and increase retirement age, the elderly are pushed back to the labor market. Moreover, old people tend to take low-paid and low-skill jobs. Due to the potential for negative effects from foreign competition, the elderly are more likely to be protectionist. The ambiguity about the relationship between age and individual attitudes toward trade calls for further investigation.

Views on trade policies are also likely to be correlated with regional characteristics. The speed of demographic transition is not the same even within a country. Where the fraction of the elderly in the total population is large, the salience for individuals of population aging and labor market is likely to be higher. Therefore, the potential for negative effects from foreign competition tends to generate a bias in favor of protection.

This study examines the association between age and trade policy preferences in the graying society. The key questions the present paper is addressing are as follows: (i) how does age affect public opinion on trade openness? and (ii) does the effect depend on the salience of population aging-related issues and regional demographic structure?

We conduct a survey experiment in Japan. There are various reasons why it is important to analyze the basis of Japaneses' trade opinions. First, Japan is notable as a country in which the proportion of elderly is increasing particularly rapidly. According to the World Bank, about 27% of the total population are aged 65 years or older as of 2017. By the year 2050, this number is estimated to increase to a third of the population (ILC Japan 2013). As the population share of elderly people rises in many countries, the Japanese experience will be informative for other countries. Secondly, Japan is highly dependent on trade. A rapid economic growth in the post-

war era was achieved through various industrial policy measures by the government to promote exports (Johnson 1982). In 2017, Japan was the 4th largest exporter and importer in the world. The rapid aging of population and dependence on trade make Japan as an ideal case to examine the relationship between the two factors.

The main results of this study are twofold. First, elderly people are less likely to support import restrictions. A commonly accepted explanation for elderly people's higher level of support for trade liberalization is that they tend to play a significant role of consumers. Second, in aged prefectures with a high percentage of the population aged 65 years old and over, elderly people are more likely to support import restrictions, compared to those in less aged prefectures. The old age poverty and negative job- and income-related consequences of trade liberalization become more imminent issues for senior citizens living in aged prefectures. Elderly people in such regions are more likely to be pushed to work by desperation or respond to opportunities to work. The higher support for trade protections among them reflects a rational response to concerns about the employment volatility that also accompanies trade liberalization. This is more so for those who are exposed to the aging population issue from a producer perspective. In other words, producer-priming is especially effective in mobilizing support for protectionism among those who face the high threat to job security from an open economy.

To our knowledge, this study is the first to empirically evaluate the effect of the graying population on public attitudes toward trade. This research carries several important implications for studies of policy preferences and public opinion. First, our study suggests that individuals do not construct their attitudes toward trade openness as an isolated phenomenon, but they evaluate the impact of trade in concurrence with their knowledge about socio-economic changes. Individuals' positions in non-trade related phenomena affect their cost-benefit calculation of the impact of trade. In particular, our study shows that growing economic precarity in a post-retirement life in the face of rapidly aging population heightens a worker's identity while weakening an identity as a consumer of imported goods in evaluating international trade. Second, while many studies have suggested that age is an important dimension of social cleavages (Lynch 2006), this research

3

suggests an alternative interpretation of the effect of aging population. That is, growing economic concerns of senior citizens and increasing pressures to remain in the labor market can make their policy preferences to converge with the working-age group, particularly those with low skills.

The rest of the paper proceeds as follows. A brief review of relevant literature is given in Section 2. Section 3 addresses hypotheses. Section 4 describes the data and the experiment and also explains the econometric strategy. Section 5 reports the results and discuss implications, and Section 6 concludes the paper.

2 Literature review

How do citizens form opinions about international trade? Economists and political scientists have long debated the determinants of trade policy preferences.

The leading theoretical explanation for trade policy preferences centers on material interests of workers. In particular, the Heckscher-Ohlin (and the Stolper-Samuelson theorem) and Ricardo-Viner models suggest that in developed countries, high-skilled workers or individuals working in export-oriented sectors support free trade, whereas low-skilled workers or individuals working in import-competing sectors oppose it. In developing countries, the patterns are expected to be opposite. Both theories assume that trade attitudes are fixed, unless someone's skills or industry of employment change. Empirically, a sheer volume of research on trade preferences emphasizes the expected income effects of trade on individuals with specific skill levels and other labor market attributes, which lends support to the insights of the models (e.g., Blonigen 2011; Mayda and Rodrik 2005; Scheve and Slaughter 2001).

However, consumer interests are rarely analyzed explicitly as independent sources of trade policy preference.[1] This propensity to overlook consumer-oriented concerns in mass policy preferences is not without reason. Baker (2009) argues that consumer interests unify citizens' preferences across classes and wealth levels more than they divide them. Citizens in all income groups

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[1] An exception is the work of Amiti et al. (2017), which considers only the consumer benefits of China's WTO accession. However, it does not consider trade policy preference explicitly.

prefer lower and more stable prices to higher and less stable ones, whereas demands for higher wages create divisions between capital and labor and between all consumers and the workers making such demands. Furthermore, differences in consumption patterns across economic groups are smaller than differences in labor-market criteria, such as skills and geographical location. In addition, the costs and benefits of an economic policy are often spread across all consumers but concentrated among small and well-organized producer groups (Baker 2009; Haggard and Kaufman 1995). Hence, previous studies have inclined to the preferences of small groups experiencing concentrated costs or gains.

A notable exception is Baker (2005) claiming that consumption-based interests and concerns are the primary determinants of public opinion. He shows that consumers of imported goods favor free trade. Taking into account the role of dual identities that citizens have as income-earners and consumers, Naoi and Kume (2015) investigate how attitudes toward trade differ depending on which aspect of respondents' lives is activated. They use a survey experiment in Japan with visual stimuli to encourage respondents to think about trade through either a producer or consumer lens, and find that the activation of a consumer perspective is associated with much higher support for free trade. In contrast, Naoi and Kume (2011) find no systematic effect of consumer priming on respondents' attitudes toward food imports. They find that producer priming increases respondents' opposition to food imports, particularly among those who fear future job insecurity. As in Naoi and Kume (2011) and Naoi and Kume (2015), we focus on the duality of citizen interests and individuals' susceptibility to frames and primes.

These effects can be conditional on regional characteristics. Ardanaz et al. (2013) find that individuals in import-competing regions have stronger prior beliefs about the effects of trade and are less affected by frames than individuals living elsewhere. In addition to the duality of citizen interests, we also consider the regional demographic structure and find that producer priming makes respondents more supportive of protectionism in rapidly aging regions.

Regarding the impact of age, among others, Tomiura et al. (2016) find that those above retirement age tend to favor freer imports. Naoi and Kume (2011) find that respondents over age 50

5

become more protectionist when they view the producer treatment. Our findings are somewhat consistent with these results.

Yet, little attention has been paid to the link between demographic change and international trade. These studies consider factor market changes. For example, Sayan (2005) shows that aging makes the country relatively more capital-abundant and thus specialize in the capital-intensive sector. Moreover, Sayan (2005) presents numerically that the representative household in the aging country tends to lose from trade in the free trade steady state. Similarly, Naito and Zhao (2009) theoretically show that the aging country endogenously becomes a small country exporting the capital-intensive good. Cai and Stoyanov (2016) suggest that aging societies would specialize in industries that use age-appreciating skills intensively (e.g., industries that rely more on speech and language abilities) and import age-depreciating-intensive goods that are produced in industries that rely mainly on multitasking, memory and speed of information processing. Our paper differs from theirs in that it studies the influence of perceptions about population aging issues on individuals' trade preferences, rather than dynamic patterns of international trade. To the best of our knowledge, Ito et al. (2019) is the only study investigating the direct relationship between regional demographic structure and individuals' trade policy preferences. They find that people residing in a region with a high share of agricultural workers are likely to support import restrictions even if they do not engage in agriculture.

3   Hypotheses

As a hypothesis, young people who are far from the pension age would not regard foreign competition as a beneficent force and thus they would be more against trade openness. Pension age people or those near the pension age would see trade openness more positively because they benefit economically from free trade through lower prices and a greater variety of goods. In other words, policy preferences of old people are no longer formed as producers or workers, but as consumers. This prediction is supported by Tomiura et al. (2016).

Elderly people in prefectures dominated by old-age citizens are more likely to respond to opportunities to work or be pushed to work by desperation. As more people reach the traditional retirement age in good health, more are physically able to remain on the job. Old workers are becoming closer skill substitutes for young workers, particularly in jobs where the productivity return to experience is high (Maestas and Zissimopoulos 2010). They may also need to work longer in order to support consumption over a longer lifespan. The labor force participation rate for men 65 and older in Japan is over 30% (Clark et al. 2008). Indeed, our data show that the shares of full-time and self-employed workers among old-age respondents are higher in most aged prefectures than in least aged prefectures (Table 1).[2] As labor force participation at old ages has risen, elderly people tend to consider themselves as producers.[3] Furthermore, due to low mobility of old people, there are likely to be more job competition among old people. Given that trade liberalization may further reduce job security of the old, they have economic incentive to adopt more protectionist stances. Old-age workers in those regions tend to be less supportive of trade.

Table 1: Old-age workers

	Age ≥ 65	
	5 most aged prefectures	5 least aged prefectures
Full-time employed	1 (7.1%)	6 (4.6%)
Part-time employed	0 (0%)	12 (9.2%)
Self-employed / Family business	2 (14.3%)	9 (6.9%)
Total	14	130

Notes: The 5 most aged prefectures include Akita, Kochi, Shimane, Yamaguchi, and Tokushima. The 5 least aged prefectures include Okinawa, Tokyo, Aichi, Kanagawa, and Shiga.

Participants in our experiments who live in aged regions may react differently to our experi-

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[2]According to Statistics Japan, as of October 1, 2017, the employment rate of elderly men was the highest in Nagano Prefecture and Yamanashi Prefecture (both 41.6%), followed by Tokyo (39.0%), Fukui Prefecture (38.3%), and Iwate Prefecture (37.3%). On the other hand, the employment rate of elderly women was the highest in Nagano Prefecture and Yamanashi Prefecture (both 21.6%), followed by Gifu Prefecture (19.9%), Fukui Prefecture (19.8%), and Tochigi Prefecture (19.7%). See https://www.stat.go.jp/data/topics/topi1130.html for the details.

[3]One may argue that the elderly consume more services than the young and the additional expenditure on services comes at the expense of manufactured goods. The economy then would produce more services because it would be consuming more of them.

mental stimuli. Exposure to the population aging issue from a worker's perspective can further the interests of workers. After viewing the producer treatment, the level of respondents' perceived similarity with old-age producers increases, and then respondents are more likely to project their own mental states onto what old-age workers want regarding foreign imports (that is, protectionism). To the extent that more of the mass public believes trade is harmful for labor, we expect to see respondents show higher support for protectionism after viewing the producer treatment than those in the control group without the treatment.

We expect that respondents are less sensitive to consumer priming. As Baker (2009) points out, citizens in all ages and regions prefer lower and more stable prices to higher and less stable ones. In addition, the costs and benefits of an economic policy are often spread across all consumers.

The basic hypotheses are as follows:

Hypothesis 1 *Elderly people are less likely to support import restrictions.*

Hypothesis 2 *In prefectures with a high percentage of the population aged 65 years old and over, elderly people are more likely to support import restrictions, and more so if they are exposed to the aging population issue from a producer perspective.*

4 Empirical strategy

4.1 Data

The web-based survey was conducted through the internet panel of Nikkei Research Inc. in January 2019. The subjects of this study were 1,241 men and 1,306 women between the ages of 20 and 79, sampled in 47 prefectures of Japan. The survey was conducted so that the proportions of genders, ages, and regions approximating those for the whole of Japan as reflected in the most recent national population census of 2017.[4]

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[4]See A.1 for a comparison of the distribution of key demographic attributes between survey subjects and the national population.

4.2 Survey Experiment Procedure

There are limits to what traditional observational data can tell us about the role of perceptions in forming trade preferences. For instance, they do not tell us if people with strong opinions on trade policy have these opinions because they are well informed, or if they are well informed because they hold opinions and are motivated to learn more.

Randomized experiments are one way to get around the causal conundrum. In such experiments, subjects are randomly assigned to different treatment conditions. Randomly assigning participants' exposure to the treatments ensures that their pre-existing characteristics are likely to be equally distributed across the treatment conditions. The treatment groups are, for instance, equally likely to vary in similar ways by gender, age, and education. As the only systematic difference between the treatment groups is the information supplied in the treatment, any differences in attitudes about trade policy can be assumed to be directly related to the treatment itself. Hence, we can deduce a causal relationship between exposure to information on aging population and respondents' opinion about trade.[5]

In this study, survey respondents were randomly placed into two treatment groups and the control group. The treatment groups were presented with one of the elderly poverty vignettes to see if more information (and of what type) might be associated with more positive or negative attitudes about open markets. Specifically, those in the consumer treatment group (836 respondents) were exposed to the information about the population aging issue to raise their awareness about elderly poverty from a consumer perspective, while those in the producer treatment group (853 respondents) received the information about the elderly poverty from a producer perspective. The actual texts each group received (translated into English) are in the Appendix. The control group (858 respondents) did not receive any stimulus. To ensure that the respondents in treatment groups carefully read the informational treatment and indeed received the treatment, respondents were asked a set of factual questions regarding the text. Indeed, the examination of the responses reveals that

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[5]One may argue that we cannot interpret the relationship as an indication of causality because the regression is estimated over data from one-shot survey and we consider no structural decision-making mechanisms. However, reverse causation seems unlikely in this case.

about 82.2% of the respondents correctly answered questions, demonstrating the effectiveness of experimental manipulation.

To avoid eliciting social desirability bias or demand effects, the respondents were not informed about the study's focus on trade policy preferences, but were informed that the questionnaire is on general socio-economic well-being.

As with all methodologies, there is a possibility that respondents participate in the survey with preconceptions and beliefs. We cannot randomly assign survey respondents to hold particular beliefs about the state of the world. Recognizing this limitation and embracing it leads to the interesting and practical research question of how respondents respond to the information.

Every respondent completed a battery of questions about perceived economic condition, political orientation, participation in the vote, age, gender, educational attainment, marital status, region, employment status, industry in which the respondent is employed, occupation, and income.

4.3   Public Opinion on International Trade

We asked survey respondents for their general opinions of import limits:

> "Japan should limit the import of foreign products in order to protect its national economy."

This question replicates the question that is commonly asked in similar surveys, thus ensuring comparability with prior research (see Table A.1 for survey instruments used in previous studies). Guisinger (2017) shows that sociotropic concerns are easier to move with new information.

Respondents were asked to select "Strongly agree," "Somewhat agree," "Neither agree nor disagree," "Somewhat disagree," "Strongly disagree," or "Decline to answer / Don't know" to respond. Answers are coded on a five-point scale (1 to 5), with 1 indicating "Strongly agree" and 5 indicating "Strongly disagree." "Decline to answer / Don't know" is coded as 3.

4.4 Individual-Specific Control Variables

On top of the questions on trade policy preferences, the survey asked questions on individual characteristics such as age, gender, educational attainment, marital status, region, employment status, industry affiliation, income, political views/leanings, and subjective assessments of household and national economies, as in previous studies of trade policy preferences based on other survey data (e.g., Beaulieu 2002; Blonigen 2011; Mansfield and Mutz 2009; Mayda and Rodrik 2005; Scheve and Slaughter 2001).

Referring to previous studies that use education level as a proxy for individuals' skill endowment, we sought individuals' education attainment records. We categorize individuals into five groups: junior high school, senior high school, junior college, in college, and college or graduate school.

The survey asked respondents to identify the industries in which they are employed.[6] If the respondent was retired or unemployed, he answered the industry in which he had worked for the longest period in his career. Based on the specific factors model, industry is expected to have explanatory power for trade policy preferences.

Furthermore, we controlled for potential differences in opinions of international trade that correspond with respondents' ages. To control for potential differences in opinions of trade across genders, we included a dummy variable that is equal to one if the survey respondent is female and is equal to zero if the respondent is male. Acknowledging that employment status may correspond with an individual's views on international trade, we included a dummy variable that takes the value of one if the individual reports being full-time employed and is equal to zero if the respondent is part-time employed, unemployed, or not in the labor force. We also included a variable that identifies regions (prefectures) in which survey respondents live to capture any influence that

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[6]We asked about the following 22 industries: food, beverage, and tobacco (2.2%); textiles and apparels (1.3%); paper, pulp, lumber products, and printing (0.5%); chemical products (1.6%); metals and steel (1.5%); machine (2.1%); miscellaneous manufacturing (9.1%); mining (0.2%); agriculture, fishery, and forestry (0.7%); construction (4.7%); electricity, gas, and water supply (1.0%); transportation and distribution (2.9%); telecommunication (2.8%); medical, welfare, and health care (6.9%); education (6.7%); wholesale and retail trade (7.3%); catering, restaurants, and lodging (2.0%); finance, insurance, and real estate (7.4%); miscellaneous services (15.4%); government services (5.6%); other (11.1%); and never worked or at school (7.2%).

regional demographic structure may have on public opinion of international trade. To control for income effects, we also included household income. As political views may shape an individual's opinions of trade, we included a variable that identifies left-leaning and right-leaning individuals. We also included a variable that asks respondents to assess their household economic condition, and a variable that captures their perceived national economic status.

4.5   Regional demographic structure

How individuals define their roles as producers or consumers and form their trade preferences is heavily influenced by the regional demographic structure. The speed of demographic transition is not the same even within a country. As of October 1, 2017 (the latest data available), the percentage of the population aged 65 years old and over varies across prefectures, from 21% (Okinawa) to 35.6% (Akita). Fukui and Yamanashi prefectures have the median value, 29.8%. We divide prefectures into two groups, one with the percentage of the population aged 65 years old and over higher than the median and the other with that lower than the median.

4.6   Descriptive Statistics

Table 2 presents the response frequencies for the question related to public opinion toward international trade. Beginning with the values presented in the table for the full sample, we see that nearly 35% of the survey respondents strongly or somewhat disagree with import limits. 21% of the survey respondents indicated that they strongly or somewhat agree with import restrictions. Thus, it seems reasonable to assert that a large majority of survey respondents have favorable or at least neutral opinions of international trade.

While we do see considerable support for international trade, looking to the subgroups and the corresponding survey response frequencies that are presented in Table 3, we find variation. We see that survey respondents who are male are more likely to express positive opinions of trade as compared to their female counterparts. A commonly accepted explanation for women's consistently

Table 2: Responses to the question related to public opinion toward international trade

Response by treatment type	Japan should limit the import of foreign products to protect its national economy.		
	Consumer	Producer	Control
Strongly agree	35	31	32
Somewhat agree	163	129	146
Neither agree nor disagree	353	391	367
Somewhat disagree	197	201	221
Strongly disagree	88	101	92
Total observations	836	853	858

higher level of support for trade protection has been that women tend to have less knowledge about economic issues than men.

Additionally, we see that support for trade increases as we move from the youngest age to the oldest age. This is consistent with the conclusion of Tomiura et al. (2016) that people over retirement age are more likely to favor freer imports, since their policy preferences are no longer formed as producers or workers, but as consumers.

Interestingly, both right- and left-leaning respondents may hold more favorable views of international trade relative to respondents with neutral political orientation. This is somewhat inconsistent with the prediction of a partisan, ideology-based model that left-wing governments adopt more protectionist trade policies in capital-rich countries than right-wing ones (Dutt and Mitra 2005).

We see that the number of survey respondents who oppose import restrictions increases with levels of education. Low-skilled labor tends to be less supportive of imports than high-skilled labor because increased levels of imported goods are more likely to negatively affect low-skilled wages and employment (e.g., Guisinger 2017; Kaltenthaler et al. 2004).

We also find that respondents who are full-time employed are more likely to express a positive opinion of trade relative to respondents who are part-time employed, unemployed, or who are not in the labor force.

Considering variation in response frequencies across household income classifications, we see

that survey respondents who live in high income (higher than the median) household more frequently report that they oppose import restrictions. Those with higher levels of income are more likely to benefit from higher returns on capital, to have enough resources to weather potential economic transitions generated by increased trade competition, and to benefit from purchasing cheaper imported goods.

We see that respondents who are married are more likely than respondents who are single, separated, divorced, or widowed to indicate support for trade.

To conclude, our data can replicate previous findings in the literature, which ensures the reliability and comparability of the data.

4.7 Econometric models

To consider variation in the strengths of opinions, we estimate an ordered logit model. We use a difference-in-difference-in-difference (henceforth, triple difference or DDD) strategy to estimate the effect of the treatment on trade preference of people of different ages in different regions. While the cross-sectional model often make it difficult to establish causal claims, given that the force of aging is exogenous there is little likelihood of reverse causation.

The first step in testing the second hypotheses is to interact the age variable with the region dummy variable indicating aged prefectures to allow for different effects of age across regions. We expect the coefficient on the interaction term to be negative. The next step is to interact this interaction term with each of the treatment variables. The independent variables of interest for triple-difference regression are the triple interaction terms. If exposure to the aging population issue from a worker's perspective helps older people identify themselves as workers, we expect the coefficient on the triple interaction term with the producer treatment variable to be negative.

Table 3: Comparison of treatment effects on public opinion toward international trade, by subgroup (5 "most pro-trade")

	Consumer			Producer			Control		
	Obs.	Mean	S.D.	Obs.	Mean	S.D.	Obs.	Mean	S.D.
All	836	3.17	1.00	853	3.25	0.97	858	3.23	0.98
Female	436	2.97	0.89	430	3.13	0.86	440	3.10	0.85
Male	400	3.38	1.06	423	3.36	1.07	418	3.36	1.08
Age: 20-29	78	3.04	1.00	90	3.01	0.88	86	3.06	0.83
Age: 30-39	137	3.01	1.00	118	3.16	0.94	135	3.13	0.94
Age: 40-49	204	3.10	0.96	226	3.13	0.93	226	3.14	0.90
Age: 50-59	150	3.28	0.98	181	3.30	1.01	144	3.31	1.05
Age: 60-69	146	3.21	1.03	115	3.48	0.96	154	3.34	1.03
Age: 70-79	121	3.34	1.00	123	3.42	1.03	113	3.38	1.06
Political orientation:									
Left (0-4)	122	3.29	1.17	126	3.41	1.14	124	3.30	1.07
Neutral (5)	493	3.10	0.91	509	3.11	0.87	504	3.16	0.88
Right (6-10)	221	3.26	1.08	218	3.47	1.03	230	3.33	1.11
No university education	392	3.06	0.91	376	3.13	0.89	381	3.12	0.92
University education	444	3.26	1.06	477	3.34	1.03	477	3.31	1.01
Full-time worker	345	3.21	1.03	389	3.23	0.99	351	3.26	1.02
Part-time, unemployed, or not in the labor force	491	3.14	0.97	464	3.27	0.96	507	3.21	0.95
Low income	362	3.15	1.02	334	3.19	0.98	394	3.22	0.97
High income	474	3.18	0.98	519	3.29	0.97	464	3.23	0.99
Married	506	3.21	1.00	544	3.31	0.98	511	3.26	1.02
Non-married	330	3.11	0.99	309	3.13	0.95	347	3.17	0.90

The basic DDD regression equation is given by:

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\begin{aligned}
Y_i = & \beta_1 \text{Age}_i + \beta_2(\text{Age}_i \times \text{Aged regions}_p) \\
& + \beta_3(\text{Age}_i \times \text{Aged regions}_p \times \text{Consumer treatment}_i) \\
& + \beta_4(\text{Age}_i \times \text{Aged regions}_p \times \text{Producer treatment}_i) \\
& + \beta_5(\text{Age}_i \times \text{Consumer treatment}_i) \\
& + \beta_6(\text{Age}_i \times \text{Producer treatment}_i) \\
& + \beta_7(\text{Aged regions}_p \times \text{Consumer treatment}_i) \\
& + \beta_8(\text{Aged regions}_p \times \text{Producer treatment}_i) \\
& + \beta_9 \text{Consumer treatment}_i + \beta_{10} \text{Producer treatment}_i \\
& + \beta_{11} \text{Aged regions}_p + \gamma X_i + \varepsilon_{ip}
\end{aligned}
$$

where Y_i is a variable measuring individuals' trade preferences. The subscript i refers to individuals and p refers to prefectures. Aged regions$_p$ is a dummy variable that is equal to 1 in prefectures with a high percentage of the population aged 65 years old and over (i.e., higher than the median percentage). X_i is a vector of control variables that can be observed for individuals. Robust standard errors, ε_{ip}, are clustered by prefecture to control for possible correlation within a prefecture.

For robustness check, we also estimate the model using the binomial logit technique while employing a dichotomous dependent variable that indicates whether respondents favor or oppose import restrictions, coded 1 if a respondent strongly disagrees or somewhat disagrees that a government should limit imports, otherwise coded 0.

5   Results

Table 4 reports the results of the ordered logistic regression analysis to examine the association between the covariates and trade policy preferences.

Table 4: Ordered Logit Estimation Results

	(1)	(2)	(3)	(4)	(5)
Age	0.019***	0.017***	0.016***	0.023***	0.018***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Age × Aged regions				-0.012**	-0.004
				(0.006)	(0.006)
Age × Aged regions × Consumer treatment					0.003
					(0.010)
Age × Aged regions × Producer treatment					-0.028**
					(0.013)
Age × Consumer treatment			-0.001		-0.002
			(0.005)		(0.007)
Age × Producer treatment			0.004		0.017**
			(0.007)		(0.009)
Aged regions × Consumer treatment					-0.217
					(0.519)
Aged regions × Producer treatment					1.334**
					(0.643)
Consumer treatment		-0.092	-0.055		0.055
		(0.069)	(0.291)		(0.345)
Producer treatment		0.058	-0.163		-0.754*
		(0.071)	(0.358)		(0.411)
Aged regions				0.551*	0.171
				(0.304)	(0.304)
Left-right	0.038	0.038	0.038	0.034	0.037
	(0.057)	(0.031)	(0.032)	(0.031)	(0.032)
Voted for LDP	-0.375**	-0.168*	-0.170*	-0.160*	-0.167*
	(0.187)	(0.088)	(0.089)	(0.087)	(0.089)
Female	-0.430***	-0.482***	-0.483***	-0.491***	-0.489***
	(0.151)	(0.087)	(0.087)	(0.088)	(0.089)
Education	0.131**	0.145***	0.145***	0.144***	0.145***
	(0.056)	(0.034)	(0.034)	(0.035)	(0.035)
Married	0.050	-0.002	-0.000	0.001	-0.004
	(0.159)	(0.096)	(0.095)	(0.097)	(0.097)
Full-time worker	0.075	-0.022	-0.020	-0.016	-0.016
	(0.120)	(0.087)	(0.086)	(0.085)	(0.087)
Ind: Food, beverage, and tobacco	-0.227	-0.008	-0.006	-0.034	-0.033
	(0.587)	(0.293)	(0.300)	(0.291)	(0.304)
Ind: Textile and apparel	-0.080	-0.019	-0.008	0.026	0.038
	(0.624)	(0.317)	(0.321)	(0.328)	(0.333)
Ind: Paper, pulp, lumber products, and printing	-2.164**	-1.210**	-1.219**	-1.172**	-1.200**
	(1.066)	(0.584)	(0.586)	(0.578)	(0.603)
Ind: Chemical products	-0.569	0.083	0.081	0.096	0.077
	(0.670)	(0.343)	(0.340)	(0.338)	(0.336)
Ind: Metals and steel	-0.915	-0.368	-0.376	-0.383	-0.389

Table 4 (Continued)

	(0.581)	(0.239)	(0.242)	(0.246)	(0.250)
Ind: Machine	-0.029	0.094	0.085	0.056	0.026
	(0.494)	(0.219)	(0.218)	(0.215)	(0.217)
Ind: Miscellaneous manufacturing	0.201	0.195	0.190	0.172	0.164
	(0.197)	(0.129)	(0.129)	(0.128)	(0.124)
Ind: Mining	-0.451	-0.575***	-0.561***	-0.732***	-0.604***
	(0.333)	(0.191)	(0.184)	(0.257)	(0.200)
Ind: Agriculture, fishery, and forestry	-0.703	-0.258	-0.234	-0.263	-0.345
	(0.964)	(0.639)	(0.638)	(0.640)	(0.648)
Ind: Construction	-0.141	0.151	0.156	0.120	0.144
	(0.289)	(0.201)	(0.201)	(0.203)	(0.205)
Ind: Electricity, gas, and water supply	0.291	0.563	0.562	0.615	0.643
	(0.551)	(0.391)	(0.394)	(0.393)	(0.396)
Ind: Transportation and distribution	-0.495**	-0.269	-0.273	-0.271	-0.306*
	(0.249)	(0.193)	(0.186)	(0.194)	(0.167)
Ind: Telecommunication	-0.925**	-0.406	-0.406	-0.428	-0.416
	(0.416)	(0.323)	(0.323)	(0.319)	(0.319)
Ind: Medical, welfare, and health care	-0.217	-0.116	-0.120	-0.113	-0.115
	(0.189)	(0.153)	(0.151)	(0.152)	(0.153)
Ind: Education	-0.522**	-0.167	-0.169	-0.171	-0.167
	(0.266)	(0.203)	(0.204)	(0.204)	(0.209)
Ind: Wholesale and retail trade	-0.651***	-0.259*	-0.258*	-0.254*	-0.262*
	(0.248)	(0.147)	(0.147)	(0.145)	(0.146)
Ind: Catering, restaurants and lodging	-0.171	-0.208	-0.209	-0.233	-0.202
	(0.813)	(0.406)	(0.407)	(0.404)	(0.410)
Ind: Finance, insurance, and real estate	-0.282	0.057	0.058	0.035	0.030
	(0.350)	(0.158)	(0.158)	(0.155)	(0.149)
Ind: Government services	-0.483	-0.165	-0.166	-0.158	-0.161
	(0.336)	(0.189)	(0.192)	(0.188)	(0.191)
Ind: Other	-0.443**	-0.269*	-0.268*	-0.281*	-0.291*
	(0.217)	(0.158)	(0.159)	(0.148)	(0.154)
Household income	0.027	0.023*	0.023*	0.023*	0.023*
	(0.018)	(0.013)	(0.013)	(0.013)	(0.013)
Perceived national economy	0.354***	0.150**	0.149**	0.153**	0.152**
	(0.129)	(0.067)	(0.068)	(0.067)	(0.071)
Perceived household economy	-0.228***	-0.126**	-0.125**	-0.122**	-0.125**
	(0.065)	(0.051)	(0.051)	(0.050)	(0.050)
Observations	858	2,246	2,246	2,246	2,246
Log pseudolikelihood	-1142	-3026	-3026	-3025	-3020

Notes: Standard errors in parentheses clustered by prefecture. * significant at 10%; ** significant at 5%; *** significant at 1%.

First, we focus on the control group which did not receive any stimulus in order to assess the

direct effects of age and population aging. We find the estimated coefficient of the age variable is positive and statistically significantly different from zero. We can interpret the coefficient, in general terms, as follows: All else held constant, support for trade is significantly higher among older individuals. More specifically, in column (1), if the respondent's age increases by 1, holding all other variables constant at their mean values, the odds that the respondent strongly disagrees that Japan should limit the imports increases by 0.2%. The magnitudes of the marginal effect of age are quite robust and hold for other specifications as well. This result supports Hypothesis 1.

In columns (2) and (3), we estimate the treatment effects. Two treatment groups are primed on the elderly poverty issue from the perspective of consumers and workers. The treatment variables themselves are not statistically significant, however. In column (3), we further include interaction terms between age and treatments. Since it is often difficult to interpret interaction terms immediately by looking at the coefficients, we visualize the outcome in Figure 1. The graph displays predicted probabilities of strongly disagreeing with import restrictions by age and treatment groups with 95% confidence intervals. It shows that the producer-priming provokes lower levels of opposition to import than in other groups, especially for those 40 years old and over.

Do these treatment effects differ by age and regions? To answer this question, columns (4) and (5) further consider a regional characteristic related to the population aging. Column (4) includes an interaction term between age and a region dummy variable. The positive relationship between age and the support for free trade is shown to be weaker in aged prefectures with a high percentage of the population aged 65 years old and over. This result supports Hypothesis 2.

Column (5) includes the triple interaction terms among age, a region dummy variable, and treatment variables. The estimated coefficient of the triple interaction term with the producer treatment variable is negative, while that with the consumer treatment variable is statistically insignificant. Elderly people in more aged prefectures are less likely to support free trade, compared to those in less aged prefectures, and more so when they assess their positions on trade from a producer perspective. This result supports Hypothesis 2. Note that the consumer-priming did not mobilize additional protectionist sentiments from the control group. Interestingly, the estimated coefficients

Figure 1: Predicted Probability of Strongly Disagreeing with Import Limits by Age and Treatment Groups
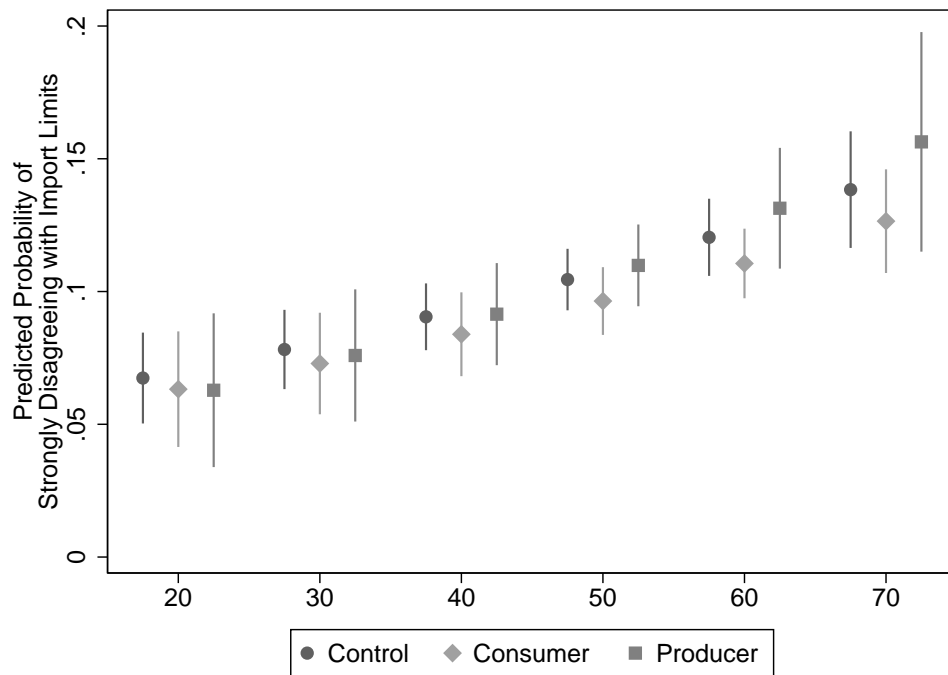
Note: Predicted probabilities and 95% confidence intervals derived from coefficients reported in column (3) in Table 4.

of the treatment variables are not statistically significantly different from zero. We can state that the exposure to aging population issues itself does not influence the typical respondent's opinion on international trade.

To gain a sense of the extent to which an isolated change in each of the explanatory variables affects the likelihood that a given survey respondent will have a positive view of international trade, we consider the change in the probability that an otherwise typical survey respondent will express the positive opinion toward international trade by allowing each variable to change from its corresponding minimum value to its maximum value while holding all other variables constant at their mean values. We see that when age changes from its minimum value to its maximum value the probability that a typical survey respondent strongly disagrees that Japan should limit imports increases by 10%. Further, a change in age from its minimum value to its maximum, all else constant, produces an 15% increase in the probability that a respondent somewhat disagrees

that Japan should limit imports. Additionally, the probability that a respondent somewhat agrees decreases by 15%.

In aged prefectures with a high percentage of the population aged 65 years old and over, a change in age from its minimum value to its maximum, all else constant, produces an 6% increase in the probability that a respondent strongly disagrees that Japan should limit imports. In contrast, in less aged prefectures with a low percentage of the population aged 65 years old and over, a change in age from its minimum value to its maximum produces an 13% increase in the probability that a respondent strongly disagrees that Japan should limit imports of foreign products. It is remarkable that the effect of regional factor is significant.

We now turn our attention to treatment effects. In aged prefectures, for those who are exposed to the aging population issue from a producer perspective, a change in age from its minimum value to its maximum, all else constant, produces an 2% increase in the probability that a respondent strongly disagrees that Japan should limit imports. For those who are not exposed to the aging population issue from a producer perspective, a change in age from its minimum value to its maximum produces an 8% increase in the probability that a respondent strongly disagrees that Japan should limit imports. We can conclude that in aged prefectures with population aging rapidly, elderly people who are exposed to the aging population issue from a producer perspective are less likely to support free trade, compared to those who are not. Exposure to the aging population issue from a consumer's perspective does not influence individuals' trade preferences.

Turning our attention to the remaining explanatory variables, we find that their estimated coefficients are largely consistent with our expectations and our intuition regarding individuals' opinions on international trade. More specifically, female respondents are less likely, relative to male survey respondents, to express a positive view on trade. It is thought that there is concern about the safety of imported goods. Those who supports democrats more inclined to support for trade protection.[7] Concerning the connection with the trade theory, labor market attributes, such as education, income, and industry affiliation, are significantly correlated with individuals' trade policy

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[7]McArthur and Marks (1988) find comparable results.

preferences. Table 4 indicates that the probability that a survey respondent will express a positive opinion of trade increases with their level of educational attainment. We also find that survey respondents who live in high income are more likely to express positive views on trade. The positive correlation between income or higher educational attainment and free trade policy preference is consistent with the assumption of perfect factor mobility across sectors predicted by the Stolper-Samuelson theorem. In addition, the effects on the probability of supporting import restrictions for people associated with paper, mining, transportation and distribution, wholesale and retail trade industries are statistically significant compared to that among people who engage in miscellaneous services as a base. Interestingly, respondents with more economic optimism at the national level is more likely to be pro-trade, while those with more economic optimism at the household level is less likely to be pro-trade. The overall results are in line with those of many previous studies.

We also consider possible differences in preferences in terms of employment status. However, contrary to expectations, the dummy for full-time employees is not statistically significant, and therefore there is no difference in the likelihood of favoring import restrictions between full-time and non-full-time workers.

To summarize, our results show that demographic aging concerns play a significant and substantial role in how individuals think about trade openness. Overall, population aging concerns from a producer perspective correlate positively with protectionist attitudes. This indicates that knowledge about population aging activates respondents' consciousness as workers or income earners and reduces support for trade, especially in aged regions. This study suggests that it is possible to move individual opinion toward trade policy by offering new information. Nevertheless, the use of consumer priming is unlikely to mobilize opposition to trade. Finally, our findings should be regarded as suggestive rather than definitive.

One may explain the positive views of trade expressed by the elderly as cohort effects. A generational cohort is a group of individuals similar in age who have experienced the same historical events within the same time period. The old generation in Japan has good experience with trade in the past, far different than the experience of younger generation cohorts. The World War II

destroyed Japan's economy almost completely. However, it was able to recover quickly, supported by the dramatic growth of exports. Japan's exports expanded rapidly at 14.8 percent annually for the average of 1950–63, which was 2.7 times as fast as the growth in world trade (Kojima 1965). Hence, old generation may express positive attitudes toward international trade. On the contrary, the deflation generation who was born after Japan's economic boom has only lived in with bad economic news. Thus, young generation holds more negative views of trade. Cohort factors could account for our age-related finding, but they do not account for all the age-related effects. We observe the increasingly positive views of trade, not only over generations but within one generation.

5.1 Robustness Checks

This section reports results from alternative cases in order to check robustness. First, the response of "decline to answer or don't know" is excluded. This case might be plausible since these undecided or indifferent people may not show up to vote. As a result, about 6% of individuals are dropped. The estimated coefficients reported in Table A.2 confirm that excluding these respondents does not affect our finding.

In Tables A.3 and A.4, we find that priming effects are weaker among individuals employed in service than among those in the manufacturing sector. It may be because there are more young people in manufacturing sectors and they are more likely to be sensitive to priming effects regarding the elderly poverty. The estimated coefficients remain largely unaffected.

The logit estimation results are shown in Table A.5. The estimates confirm that all the estimated coefficients remain largely unaffected, even if we aggregate our previous five-step ordering into a binary dummy.

6   Conclusions

In this study, we conduct an empirical study on the association between perceptions about elderly poverty, regional demographic structure, and trade policy preferences, and employ original

individual-level survey experiment data. The results of the ordered logit model reveal that elderly people are more likely to support free trade. More importantly, we show that growing economic precarity in a post-retirement life in the face of rapidly aging population heightens a worker's identity while weakening an identity as a consumer of imported goods in evaluating international trade. As a result, in aged prefectures with population aging rapidly, elderly people who are exposed to the aging population issue from a producer perspective are less likely to support free trade. Altogether, it is interesting to see that rising protectionism might have deep roots in demography. Going forward, more effort needs to be devoted to understanding the relationship between the two. Furthermore, if the relationship is as conditional as our data suggest, the conditional effect also underscores the need for further investigation in this direction.

A limitation is that this study cannot address whether and why mass attitudes toward trade change over time. Individual-level panel data may be used, if available, to capture changes over time in trade preferences and to rule out potentially spurious associations. However, note that the external validity of analyses based on panel data can be jeopardized by unrepresentative samples stemming from panel attrition or poor response rates (Mansfield et al. 2016).

It will be useful to investigate whether our results are likely to hold across other countries. The issue of population aging in developing countries entails more serious economic problems than in developed countries. We leave this idea for future research.

References

Amiti, M., Dai, M., Feenstra, R. C., and Romalis, J. (2017). How did china's wto entry benefit us consumers? National Bureau of Economic Research.

Ardanaz, M., Murillo, M. V., and Pinto, P. M. (2013). Sensitivity to Issue Framing on Trade Policy Preferences: Evidence from a Survey Experiment. *International Organization*, 67(2):411–437.

Baker, A. (2005). Who Wants to Globalize? Consumer Tastes and Labor Markets in a Theory of Trade Policy Beliefs. *American Journal of Political Science*, 49(4):924–938.

Baker, A. (2009). *The Market and the Masses in Latin America: Policy Reform and Consumption in Liberalizing Economies*. Cambridge University Press.

Beaulieu, E. (2002). Factor or Industry Cleavages in Trade Policy? An Empirical Analysis of the Stolper–Samuelson Theorem. *Economics & Politics*, 14(2):99–131.

Bechtel, M. M., Bernauer, T., and Meyer, R. (2012). The Green Side of Protectionism: Environmental Concerns and Three Facets of Trade Policy Preferences. *Review of International Political Economy*, 19(5):837–866.

Blonigen, B. A. (2011). Revisiting the Evidence on Trade Policy Preferences. *Journal of International Economics*, 85(1):129–135.

Cai, J. and Stoyanov, A. (2016). Population Aging and Comparative Advantage. *Journal of International Economics*, 102:1–21.

Chaudoin, S. (2014). Promises or Policies? An Experimental Analysis of International Agreements and Audience Reactions. *International Organization*, 68(1):235–256.

Chisik, R., Onder, H., and Qirjo, D. (2016). Aging, Trade, and Migration.

Clark, R. L., Ogawa, N., Lee, S.-H., and Matsukura, R. (2008). Older Workers and National Productivity in Japan. *Population and Development Review*, 34:257–274.

Daniels, J. P. and Von Der Ruhr, M. (2005). God and the Global Economy: Religion and Attitudes towards Trade and Immigration in the United States. *Socio-Economic Review*, 3(3):467–489.

Dutt, P. and Mitra, D. (2005). Political Ideology and Endogenous Trade Policy: An Empirical Investigation. *Review of Economics and Statistics*, 87(1):59–72.

Ehrlich, S. and Maestas, C. (2010). Risk Orientation, Risk Exposure, and Policy Opinions: The Case of Free Trade. *Political Psychology*, 31(5):657–684.

Grossman, G. M. and Helpman, E. (1994). Protection for Sale. *American Economic Review*, pages 833–850.

Guisinger, A. (2017). *American Opinion on Trade: Preferences without Politics*. Oxford University Press.

Haggard, S. and Kaufman, R. R. (1995). *The Political Economy of Democratic Transitions*. Princeton University Press.

Hainmueller, J. and Hiscox, M. J. (2006). Learning to Love Globalization: Education and Individual Attitudes toward International Trade. *International Organization*, 60(2):469–498.

Hiscox, M. J. (2006). Through a Glass and Darkly: Attitudes toward International Trade and the Curious Effects of Issue Framing. *International Organization*, 60(3):755–780.

ILC Japan (2013). A Profile of Older Japanese 2013.

Ito, B., Mukunoki, H., Tomiura, E., and Wakasugi, R. (2019). Trade policy preferences and cross-regional differences: Evidence from individual-level data of japan. *Journal of the Japanese and International Economies*, 51:99–109.

Johnson, C. (1982). *MITI and the Japanese Miracle: The Growth of Industrial Policy, 1925-1975*. Stanford University Press, Stanford, CA.

Kaltenthaler, K. C., Gelleny, R. D., and Ceccoli, S. J. (2004). Explaining Citizen Support for Trade Liberalization. *International Studies Quarterly*, 48(4):829–851.

Kojima, K. (1965). Japan's Trade Policy. *Economic Record*, 41(93):54–77.

Lynch, J. (2006). *Age in the Welfare State: The Origins of Social Spending on Pensioner's Workers and Children*. Cambridge University Press, New York, NY.

Maestas, N. and Zissimopoulos, J. (2010). How Longer Work Lives Ease the Crunch of Population Aging. *Journal of Economic Perspectives*, 24(1):139–60.

Mansfield, E. D. and Mutz, D. C. (2009). Support for Free Trade: Self-Interest, Sociotropic Politics, and Out-Group Anxiety. *International Organization*, 63(3):425–457.

Mansfield, E. D., Mutz, D. C., and Brackbill, D. (2016). Effects of the Great Recession on American Attitudes toward Trade. *British Journal of Political Science*, pages 1–22.

Mayda, A. M. and Rodrik, D. (2005). Why are Some People (and Countries) More Protectionist than Others? *European Economic Review*, 49(6):1393–1430.

McArthur, J. and Marks, S. V. (1988). Constituent Interest vs. Legislator Ideology: The Role of Political Opportunity Cost. *Economic Inquiry*, 26(3):461–470.

Naito, T. and Zhao, L. (2009). Aging, Transitional Dynamics, and Gains from Trade. *Journal of Economic Dynamics and Control*, 33(8):1531–1542.

Naoi, M. and Kume, I. (2011). Explaining Mass Support for Agricultural Protectionism: Evidence from a Survey Experiment during the Global Recession. *International Organization*, 65(4):771–795.

Naoi, M. and Kume, I. (2015). Workers or Consumers? A Survey Experiment on the Duality of Citizens' Interests in the Politics of Trade. *Comparative Political Studies*, 48(10):1293–1317.

Nguyen, Q. (2017). "Mind the Gap?" Rising Income Inequality and Individual Trade Policy Preferences. *European Journal of Political Economy*, 50:92–105.

O'Rourke, K. H. and Sinnott (2001). The Determinants of Individual Trade Policy Preferences: International Survey Evidence. In *Brookings Trade Forum*, pages 157–206.

Ponzetto, G. A. (2011). Heterogeneous Information and Trade Policy.

Rho, S. and Tomz, M. (2015). Industry, Self-Interest, and Individual Preferences over Trade Policy.

Sabet, S. (2014). Feelings First: Non-Material Factors as Moderators of Economic Self-Interest Effects on Trade Preferences. Mimeo, Princeton, NJ: Princeton University.

Sayan, S. (2005). Heckscher–Ohlin Revisited: Implications of Differential Population Dynamics for Trade within an Overlapping Generations Framework. *Journal of Economic Dynamics and Control*, 29(9):1471–1493.

Scheve, K. F. and Slaughter, M. J. (2001). What Determines Individual Trade-Policy Preferences? *Journal of International Economics*, 54(2):267–292.

Tomiura, E., Ito, B., Mukunoki, H., and Wakasugi, R. (2016). Individual Characteristics, Behavioral Biases, and Trade Policy Preferences: Evidence from a Survey in Japan. *Review of International Economics*, 24(5):1081–1095.

United Nations (2017). *World Population Ageing*. New York: United Nations Department of Economic and Social Affairs, Population Division.

Appendix

Figure A.1: Comparison between Target Quota and Collected Data

Target Quota (within +-5%)
(Based on the 2017 Census)

	20-29	30-39	40-49	50-59	60-69	70-79
male	7.0%	8.4%	10.3%	8.1%	9.3%	6.6%
female	6.6%	8.1%	10.0%	8.1%	9.7%	7.9%

Hokkaido/Tohoku	11.3%
Kanto	33.7%
Chubu	18.1%
Kinki	16.9%
Chugoku/Shikoku	8.6%
Kyushu/Okinawa	11.4%

Collected (%)

	20-29	30-39	40-49	50-59	60-69	70-79
male	6.5%	8.7%	9.8%	9.6%	8.9%	7.9%
female	6.1%	7.9%	8.9%	8.4%	10.3%	7.3%

Hokkaido/Tohoku	11.9%
Kanto	31.5%
Chubu	18.4%
Kinki	17.8%
Chugoku/Shikoku	10.4%
Kyushu/Okinawa	10.2%

Collected (#)

	20-29	30-39	40-49	50-59	60-69	70-79
male	130	174	196	191	177	157
female	121	158	177	167	206	146

Hokkaido/Tohoku	238
Kanto	629
Chubu	367
Kinki	355
Chugoku/Shikoku	208
Kyushu/Okinawa	203

Consumer treatment:

As the nation with the third largest economy in the world, one may assume that poverty in Japan is very rare. However, as the society is rapidly aging, poverty among the post-65 populations is rising. As a consequence, **a growing number of seniors cannot afford basic consumer goods and groceries**, and are struggling to meet basic economic needs.

Producer treatment:

As the nation with the third largest economy in the world, one may assume that poverty in Japan does not exist. However, as the society is rapidly aging, poverty among the post-65 populations is rising. **A growing number of seniors take up low-paying and temporary jobs past their retirement age**, struggling to meet basic economic needs.

After the vignettes, respondents were asked the following questions:

- Choose the answer based on your reading. Poverty among _____ is rising.

  1. Children
  2. Rural households
  3. Urban households
  4. The elderly
  5. Don't know

- Choose the answer based on your reading. What specific aspect of the elderly poverty is discussed?

  1. Being forced to work at low-paying and temporary jobs after retirement age
  2. Not being able to afford basic consumer goods and groceries
  3. Not being able to afford to buy a house
  4. The elderly poverty is not a serious issue.

- In your opinion, how serious is the elderly poverty issue in Japan?

  1. Very serious
  2. Somewhat serious
  3. Not very serious
  4. Not at all serious
  5. Decline to answer / Don't know

Table A.1: A Variety of Survey Instruments for Trade Policy Preferences

Question wording	Examples of works
"Do you favor or oppose placing new limits on imports, or haven't you thought much about this?"	Scheve and Slaughter (2001); Hainmueller and Hiscox (2006); Rho and Tomz (2015); Nguyen (2017)
"How much do you agree or disagree with the following statement: [*respondent's country*] should limit the import of foreign products in order to protect its national economy?"	O'Rourke and Sinnott (2001); Mayda and Rodrik (2005); Daniels and Von Der Ruhr (2005); Hainmueller and Hiscox (2006)
"Do you think it is better if: Goods made in other countries can be imported and sold here if people want to buy them; There should be stricter limits on selling foreign goods here, to protect the jobs of people in this country; or Don't Know."	Mayda and Rodrik (2005); Baker (2005); Kaltenthaler et al. (2004)
"Do you favor or oppose increasing trade with other nations?" "Is that strongly favor (oppose) or somewhat favor (oppose)?"	Hiscox (2006)
"Do you think the government should try to encourage international trade or to discourage international trade? Do you think the government should encourage/discourage international trade a lot, or only a little?"	Mansfield and Mutz (2009); Chaudoin (2014); Rho and Tomz (2015)
"Import from foreign countries has been increasing in the past. What is your opinion on this?"	Naoi and Kume (2011)
Economic openness: "The opening of Switzerland toward international markets, often referred to as globalization, will yield more negative than positive consequences for our country" Job-related: "The Swiss government should restrict access of foreign products to the Swiss market in industrial sectors where jobs are in danger." Price and quality: "I don't care if a commodity is produces in Switzerland or abroad as long as its quality and price are right."	Bechtel et al. (2012)
"Do you think that restrictions on buying goods made in other countries should be increased, decreased, or kept at the current level?" "Do you think that trade with other countries is good or bad for you and your family?" "Do you think that trade with other countries is good or bad for the United States as a whole?"	Sabet (2014)

Table A.2: Excluding "decline to answer or don't know"

	(1)	(2)	(3)	(4)	(5)
Age	0.018***	0.017***	0.016***	0.023***	0.018***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)
Age × Aged regions				-0.012**	-0.004
				(0.006)	(0.006)
Age × Aged regions × Consumer treatment					0.004
					(0.009)
Age × Aged regions × Producer treatment					-0.027**
					(0.013)
Age × Consumer treatment			-0.001		-0.003
			(0.005)		(0.007)
Age × Producer treatment			0.005		0.017*
			(0.007)		(0.009)
Aged regions × Consumer treatment					-0.242
					(0.521)
Aged regions × Producer treatment					1.305**
					(0.658)
Consumer treatment		-0.098	-0.059		0.065
		(0.070)	(0.295)		(0.356)
Producer treatment		0.064	-0.177		-0.760*
		(0.073)	(0.362)		(0.423)
Aged regions				0.547*	0.187
				(0.312)	(0.323)
Left-right	0.034	0.037	0.037	0.032	0.035
	(0.058)	(0.030)	(0.031)	(0.030)	(0.031)
Voted for LDP	-0.374**	-0.179**	-0.180**	-0.168*	-0.174*
	(0.187)	(0.091)	(0.091)	(0.089)	(0.090)
Female	-0.382**	-0.467***	-0.467***	-0.476***	-0.473***
	(0.157)	(0.090)	(0.090)	(0.091)	(0.092)
Education	0.139**	0.150***	0.150***	0.148***	0.149***
	(0.056)	(0.034)	(0.034)	(0.035)	(0.035)
Married	0.019	-0.021	-0.019	-0.021	-0.026
	(0.171)	(0.103)	(0.102)	(0.104)	(0.104)
Full-time worker	0.108	-0.018	-0.016	-0.010	-0.010
	(0.128)	(0.090)	(0.089)	(0.088)	(0.091)
Ind: Food, beverage, and tobacco	-0.256	0.016	0.019	-0.012	-0.004
	(0.613)	(0.319)	(0.327)	(0.314)	(0.333)
Ind: Textile and apparel	-0.067	-0.023	-0.007	0.024	0.043
	(0.733)	(0.323)	(0.328)	(0.334)	(0.341)
Ind: Paper, pulp, lumber products, and printing	-2.108**	-1.189*	-1.204*	-1.149*	-1.163*
	(1.042)	(0.638)	(0.642)	(0.632)	(0.657)
Ind: Chemical products	-0.586	0.115	0.113	0.130	0.112
	(0.642)	(0.345)	(0.340)	(0.338)	(0.335)
Ind: Metals and steel	-0.896	-0.372	-0.379	-0.379	-0.389

	(0.563)	(0.246)	(0.248)	(0.253)	(0.255)
Ind: Machine	-0.073	0.072	0.064	0.037	0.007
	(0.478)	(0.211)	(0.209)	(0.206)	(0.208)
Ind: Miscellaneous manufacturing	0.252	0.208	0.205	0.186	0.183
	(0.211)	(0.137)	(0.137)	(0.136)	(0.132)
Ind: Mining	-0.426	-0.547***	-0.531***	-0.706***	-0.568***
	(0.348)	(0.185)	(0.175)	(0.252)	(0.187)
Ind: Agriculture, fishery, and forestry	-0.676	-0.270	-0.243	-0.270	-0.350
	(0.897)	(0.605)	(0.604)	(0.606)	(0.612)
Ind: Construction	-0.163	0.142	0.147	0.114	0.141
	(0.284)	(0.201)	(0.201)	(0.203)	(0.205)
Ind: Electricity, gas, and water supply	0.531	0.757*	0.758*	0.826*	0.865**
	(0.561)	(0.427)	(0.429)	(0.432)	(0.436)
Ind: Transportation and distribution	-0.512**	-0.259	-0.264	-0.264	-0.298*
	(0.232)	(0.204)	(0.195)	(0.203)	(0.175)
Ind: Telecommunication	-0.930**	-0.393	-0.394	-0.411	-0.402
	(0.423)	(0.338)	(0.339)	(0.331)	(0.335)
Ind: Medical, welfare, and health care	-0.242	-0.122	-0.124	-0.112	-0.114
	(0.198)	(0.158)	(0.156)	(0.157)	(0.159)
Ind: Education	-0.543**	-0.175	-0.177	-0.174	-0.173
	(0.256)	(0.201)	(0.202)	(0.201)	(0.207)
Ind: Wholesale and retail trade	-0.647***	-0.255*	-0.254*	-0.251*	-0.262*
	(0.250)	(0.150)	(0.150)	(0.147)	(0.149)
Ind: Catering, restaurants and lodging	-0.206	-0.215	-0.216	-0.238	-0.208
	(0.863)	(0.402)	(0.403)	(0.400)	(0.406)
Ind: Finance, insurance, and real estate	-0.297	0.073	0.075	0.050	0.046
	(0.349)	(0.156)	(0.156)	(0.152)	(0.146)
Ind: Government services	-0.503	-0.166	-0.166	-0.158	-0.162
	(0.325)	(0.183)	(0.185)	(0.182)	(0.185)
Ind: Other	-0.448*	-0.266	-0.262	-0.278*	-0.286*
	(0.232)	(0.176)	(0.178)	(0.163)	(0.172)
Household income	0.026	0.023	0.023*	0.022*	0.023*
	(0.019)	(0.014)	(0.014)	(0.013)	(0.014)
Perceived national economy	0.365***	0.151**	0.150**	0.153**	0.153**
	(0.133)	(0.069)	(0.070)	(0.069)	(0.072)
Perceived household economy	-0.244***	-0.131**	-0.131**	-0.128**	-0.133**
	(0.077)	(0.054)	(0.054)	(0.054)	(0.053)
Observations	800	2,115	2,115	2,115	2,115
Log pseudolikelihood	-1091	-2911	-2911	-2910	-2905

Notes: Standard errors in parentheses clustered by prefecture. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table A.3: Individuals in the Manufacturing Sectors

	(1)	(2)	(3)	(4)	(5)
Age	0.023***	0.029***	0.023***	0.039***	0.025***
	(0.007)	(0.006)	(0.008)	(0.006)	(0.008)
Age × Aged regions				-0.022***	-0.001
				(0.008)	(0.015)
Age × Aged regions × Consumer treatment					-0.004
					(0.031)
Age × Aged regions × Producer treatment					-0.048**
					(0.023)
Age × Consumer treatment			-0.001		-0.001
			(0.016)		(0.025)
Age × Producer treatment			0.018		0.037***
			(0.012)		(0.013)
Aged regions × Consumer treatment					0.498
					(1.474)
Aged regions × Producer treatment					2.708**
					(1.233)
Consumer treatment		-0.222	-0.176		-0.352
		(0.165)	(0.773)		(1.162)
Producer treatment		0.154	-0.762		-1.909**
		(0.165)	(0.687)		(0.766)
Aged regions				1.030**	-0.194
				(0.407)	(0.791)
Left-right	0.101	0.137	0.135	0.129	0.135
	(0.110)	(0.084)	(0.085)	(0.087)	(0.091)
Voted for LDP	-0.635**	-0.467***	-0.448**	-0.453***	-0.416**
	(0.249)	(0.172)	(0.178)	(0.174)	(0.175)
Female	-0.958**	-0.673***	-0.668***	-0.683***	-0.667***
	(0.383)	(0.134)	(0.140)	(0.133)	(0.141)
Education	0.039	0.088*	0.092*	0.092**	0.097*
	(0.103)	(0.046)	(0.048)	(0.046)	(0.051)
Married	0.042	0.034	0.037	0.063	0.042
	(0.309)	(0.134)	(0.135)	(0.139)	(0.144)
Full-time worker	0.057	0.006	0.032	0.034	0.071
	(0.256)	(0.170)	(0.172)	(0.172)	(0.178)
Ind: Food, beverage, and tobacco	0.303	0.292	0.317	0.234	0.296
	(0.720)	(0.433)	(0.436)	(0.423)	(0.416)
Ind: Textile and apparel	0.507	0.327	0.384	0.414	0.501
	(0.746)	(0.390)	(0.380)	(0.417)	(0.393)
Ind: Paper, pulp, lumber products, and printing	-1.805	-0.947	-0.959	-0.888	-0.904
	(1.266)	(0.682)	(0.688)	(0.689)	(0.730)
Ind: Chemical products	-0.238	0.394	0.399	0.425	0.450
	(0.657)	(0.388)	(0.390)	(0.376)	(0.377)
Ind: Metals and steel	-0.671	-0.130	-0.147	-0.150	-0.079

	(0.734)	(0.378)	(0.375)	(0.386)	(0.384)
Ind: Machine	0.428	0.373	0.354	0.296	0.314
	(0.572)	(0.278)	(0.272)	(0.274)	(0.257)
Ind: Miscellaneous manufacturing	0.679**	0.488***	0.486***	0.445**	0.510***
	(0.287)	(0.181)	(0.172)	(0.186)	(0.169)
Ind: Mining	0.064	-0.201	-0.150	-0.475	-0.048
	(0.537)	(0.573)	(0.489)	(0.730)	(0.587)
Ind: Agriculture, fishery, and forestry	-0.325	-0.009	0.114	-0.024	-0.021
	(1.208)	(0.786)	(0.800)	(0.779)	(0.827)
Ind: Construction	0.374	0.479**	0.513***	0.419**	0.536***
	(0.259)	(0.203)	(0.184)	(0.207)	(0.186)
Household income	0.111**	0.056**	0.057**	0.050*	0.050*
	(0.046)	(0.026)	(0.026)	(0.027)	(0.026)
Perceived national economy	0.428*	-0.005	-0.009	-0.007	-0.004
	(0.227)	(0.094)	(0.092)	(0.096)	(0.099)
Perceived household economy	-0.429**	-0.133	-0.139	-0.125	-0.134
	(0.185)	(0.111)	(0.109)	(0.104)	(0.108)
Observations	209	600	600	600	600
Log pseudolikelihood	-271	-782	-780	-781	-775

Notes: Standard errors in parentheses clustered by prefecture. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table A.4: Individuals in the Service Sectors

	(1)	(2)	(3)	(4)	(5)
Age	0.018***	0.015***	0.017***	0.019***	0.015**
	(0.005)	(0.005)	(0.005)	(0.006)	(0.006)
Age × Aged regions				-0.007	0.003
				(0.008)	(0.009)
Age × Aged regions × Consumer treatment					-0.001
					(0.014)
Age × Aged regions × Producer treatment					-0.030*
					(0.016)
Age × Consumer treatment			-0.005		-0.004
			(0.007)		(0.010)
Age × Producer treatment			-0.001		0.015
			(0.009)		(0.013)
Aged regions × Consumer treatment					-0.029
					(0.694)
Aged regions × Producer treatment					1.302*

					(0.778)
Consumer treatment		0.001	0.231		0.232
		(0.098)	(0.359)		(0.483)
Producer treatment		0.048	0.121		-0.595
		(0.113)	(0.412)		(0.574)
Aged regions				0.325	-0.092
				(0.428)	(0.432)
Left-right	0.001	0.028	0.029	0.026	0.027
	(0.075)	(0.051)	(0.052)	(0.051)	(0.054)
Voted for LDP	-0.205	-0.060	-0.062	-0.060	-0.064
	(0.204)	(0.119)	(0.118)	(0.119)	(0.119)
Female	-0.251	-0.387***	-0.389***	-0.393***	-0.395***
	(0.171)	(0.124)	(0.124)	(0.126)	(0.125)
Education	0.147**	0.127**	0.127**	0.128**	0.126**
	(0.070)	(0.053)	(0.052)	(0.053)	(0.053)
Married	0.093	0.031	0.030	0.029	0.021
	(0.240)	(0.133)	(0.132)	(0.134)	(0.136)
Full-time worker	0.045	0.071	0.072	0.072	0.073
	(0.187)	(0.128)	(0.128)	(0.128)	(0.129)
Ind: Electricity, gas, and water supply	0.248	0.547	0.546	0.565	0.609
	(0.548)	(0.393)	(0.390)	(0.395)	(0.395)
Ind: Telecommunication	-0.876**	-0.420	-0.420	-0.422	-0.410
	(0.391)	(0.319)	(0.319)	(0.312)	(0.314)
Ind: Medical, welfare, and health care	-0.224	-0.140	-0.140	-0.142	-0.123
	(0.204)	(0.158)	(0.155)	(0.158)	(0.161)
Ind: Education	-0.558**	-0.164	-0.166	-0.167	-0.155
	(0.277)	(0.186)	(0.186)	(0.185)	(0.191)
Ind: Wholesale and retail trade	-0.637***	-0.259*	-0.260*	-0.255*	-0.262*
	(0.241)	(0.146)	(0.146)	(0.144)	(0.148)
Ind: Catering, restaurants and lodging	-0.202	-0.245	-0.247	-0.247	-0.228
	(0.762)	(0.378)	(0.382)	(0.371)	(0.382)
Ind: Finance, insurance, and real estate	-0.297	0.036	0.036	0.027	0.024
	(0.329)	(0.148)	(0.148)	(0.144)	(0.140)
Ind: Government services	-0.492	-0.184	-0.186	-0.183	-0.182
	(0.335)	(0.190)	(0.191)	(0.187)	(0.190)
Household income	0.009	0.019	0.019	0.020	0.020
	(0.029)	(0.017)	(0.017)	(0.016)	(0.016)
Perceived national economy	0.363**	0.185*	0.186*	0.186*	0.189*
	(0.181)	(0.109)	(0.110)	(0.111)	(0.114)
Perceived household economy	-0.215**	-0.112	-0.111	-0.110	-0.112
	(0.094)	(0.073)	(0.072)	(0.073)	(0.074)
Observations	486	1,253	1,253	1,253	1,253
Log pseudolikelihood	-666	-1716	-1716	-1716	-1714

Notes: Standard errors in parentheses clustered by prefecture. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table A.5: Logit Estimation Results

	(1)	(2)	(3)	(4)	(5)
Age	0.027***	0.024***	0.025***	0.029***	0.026***
	(0.006)	(0.004)	(0.005)	(0.005)	(0.005)
Age × Aged regions				-0.011*	-0.002
				(0.006)	(0.008)
Age × Aged regions × Consumer treatment					0.003
					(0.013)
Age × Aged regions × Producer treatment					-0.030**
					(0.015)
Age × Consumer treatment			-0.006		-0.007
			(0.007)		(0.009)
Age × Producer treatment			0.001		0.015**
			(0.008)		(0.008)
Aged regions × Consumer treatment					0.028
					(0.663)
Aged regions × Producer treatment					1.428*
					(0.849)
Consumer treatment		-0.011	0.278		0.273
		(0.099)	(0.347)		(0.411)
Producer treatment		0.017	-0.044		-0.702*
		(0.095)	(0.433)		(0.416)
Aged regions				0.555*	0.081
				(0.324)	(0.419)
Left-right	0.070	0.046	0.047	0.044	0.043
	(0.049)	(0.029)	(0.029)	(0.029)	(0.030)
Voted for LDP	-0.169	-0.085	-0.087	-0.084	-0.080
	(0.174)	(0.094)	(0.095)	(0.092)	(0.095)
Female	-0.517***	-0.523***	-0.523***	-0.531***	-0.527***
	(0.125)	(0.095)	(0.094)	(0.094)	(0.093)
Education	0.239***	0.216***	0.217***	0.216***	0.217***
	(0.056)	(0.038)	(0.039)	(0.038)	(0.040)
Married	0.117	0.007	0.010	0.007	-0.001
	(0.166)	(0.105)	(0.103)	(0.106)	(0.106)
Full-time worker	0.073	-0.016	-0.014	-0.013	-0.012
	(0.161)	(0.119)	(0.118)	(0.118)	(0.120)
Ind: Food, beverage, and tobacco	0.266	0.147	0.142	0.135	0.124

	(0.521)	(0.275)	(0.280)	(0.274)	(0.286)
Ind: Textile and apparel	0.052	-0.186	-0.185	-0.136	-0.136
	(0.702)	(0.382)	(0.383)	(0.379)	(0.392)
Ind: Paper, pulp, lumber products, and printing	0.000	-1.882*	-1.886*	-1.823*	-1.829*
	(.)	(1.073)	(1.073)	(1.061)	(1.064)
Ind: Chemical products	-0.198	0.098	0.087	0.102	0.080
	(0.603)	(0.298)	(0.297)	(0.300)	(0.306)
Ind: Metals and steel	-1.051	-0.676**	-0.681**	-0.687**	-0.711**
	(0.840)	(0.264)	(0.268)	(0.269)	(0.289)
Ind: Machine	-0.030	-0.084	-0.092	-0.096	-0.132
	(0.520)	(0.280)	(0.274)	(0.275)	(0.271)
Ind: Miscellaneous manufacturing	0.417	0.188	0.181	0.177	0.167
	(0.283)	(0.193)	(0.192)	(0.191)	(0.188)
Ind: Mining	0.000	0.000	0.000	0.000	0.000
	(.)	(.)	(.)	(.)	(.)
Ind: Agriculture, fishery, and forestry	-0.485	0.070	0.082	0.058	0.009
	(0.955)	(0.671)	(0.670)	(0.671)	(0.663)
Ind: Construction	-0.135	0.062	0.065	0.045	0.069
	(0.338)	(0.230)	(0.230)	(0.232)	(0.232)
Ind: Electricity, gas, and water supply	0.218	0.417	0.414	0.454	0.506
	(0.709)	(0.502)	(0.504)	(0.503)	(0.500)
Ind: Transportation and distribution	-0.720	-0.367	-0.376	-0.367	-0.399*
	(0.536)	(0.256)	(0.250)	(0.254)	(0.239)
Ind: Telecommunication	-0.562	-0.432	-0.431	-0.421	-0.392
	(0.556)	(0.385)	(0.385)	(0.384)	(0.389)
Ind: Medical, welfare, and health care	-0.117	-0.110	-0.112	-0.112	-0.110
	(0.261)	(0.200)	(0.198)	(0.200)	(0.201)
Ind: Education	-0.244	-0.096	-0.099	-0.097	-0.104
	(0.266)	(0.229)	(0.231)	(0.229)	(0.233)
Ind: Wholesale and retail trade	-0.511	-0.341*	-0.343*	-0.335*	-0.344*
	(0.340)	(0.182)	(0.184)	(0.183)	(0.186)
Ind: Catering, restaurants and lodging	0.329	-0.158	-0.164	-0.155	-0.155
	(0.741)	(0.487)	(0.490)	(0.482)	(0.491)
Ind: Finance, insurance, and real estate	0.006	0.044	0.043	0.034	0.021
	(0.362)	(0.219)	(0.218)	(0.216)	(0.209)
Ind: Government services	-0.544	-0.096	-0.098	-0.092	-0.100
	(0.375)	(0.204)	(0.204)	(0.201)	(0.201)
Ind: Other	-0.436	-0.417*	-0.418*	-0.419**	-0.441**
	(0.345)	(0.218)	(0.219)	(0.211)	(0.220)
Household income	0.026	0.018	0.017	0.018	0.018
	(0.021)	(0.016)	(0.016)	(0.016)	(0.015)
Perceived national economy	0.359***	0.150**	0.149**	0.152**	0.152**
	(0.116)	(0.066)	(0.068)	(0.066)	(0.070)
Perceived household economy	-0.183**	-0.085	-0.084	-0.083	-0.084
	(0.074)	(0.063)	(0.063)	(0.063)	(0.064)

Observations	853	2,244	2,244	2,244	2,244
Log pseudolikelihood	-515	-1384	-1383	-1382	-1378

Notes: Standard errors in parentheses clustered by prefecture. * significant at 10%; ** significant at 5%; *** significant at 1%.