A Dissertation Submitted for

the Degree of Ph.D. in Economics

AY2019

Three Essays on Other-regarding Preferences and the Community

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ACKNOWLEDGMENTS

I would like to express my deep and sincere gratitude to my supervisor, Professor Masao Ogaki, for his insightful comments, inexhaustible benevolence and patience, and constant support and guidance. He introduced me to Behavioral Economics, a fascinating and inspiring field of Economics. His passion for the truth spurs me to try something new. I have learned and been encouraged every time I have consulted him.

I am indebted to Professor Colin McKenzie for his invaluable and constructive advice on my research and for his sharp questions, which encouraged me to widen my research from various perspectives. He always helps to condense my expressions to clarify my ideas. I am grateful to Professor Hideo Akabayashi for his advice and generosity, and for giving me the opportunity to engage in the Parent-Child pair experiments, during which I learned a lot about conducting an experiment and enjoyed working with energetic and passionate children.

I would like to thank Professor Masaya Sakuragawa, Professor Charles Yuji Horioka, Professor Tomoo Kikuchi, Professor Fumio Ohtake, Professor Robert Tamura, Professor Russell Cooper, and Dr. Shusaku Sasaki for their invaluable advice and comments.

I am indebted to the Takayama International Education Foundation and the Kashiyama Scholarship Foundation for their assistance during my PhD and master's programs, and the Keio Economic Society and the Doctorate Student Grant-in-Aid Program at Keio University for funding the research. I would like to extend a special thank you to the selection committee for their comments and support from the executive office of the Takayama International Education Foundation.

I am grateful to my parents for their unconditional support and encouragement. I would also like to thank my friends Jun Xu, Shan Lin, Yintong Sun, Yang Zhao, Jun Ma, Hisako Takahashi, Zhiming Xu, Keita Masuya, Victoriia Alekhina, and Id Goh for their support and encouragement.

Chapter 1.
Introduction

The concept of "community" has started to rouse the attention of some economists, as it can aid for markets and the public sector in solving new problems faced by many developed countries. The community can be analyzed in several ways in economics; however, this dissertation focuses on the effects of the community through other-regarding preferences.

The Definition of "Community"

There are numerous ways to define the community. In a laboratory experiment, it is innocuous to treat all the experiment's participants as a community. In addition, participants with a pay-off can be regarded as being in the reference groups.[1] Rajan (2019) defines the community as individuals living in physical proximity, such as in a neighborhood. Local government, schools, and the town mayor are also regarded as a part of the community. Ogaki and Ohtake (2019) emphasize the community mechanism as a complement to public and market mechanisms in child and elderly care. They define the community mechanism as a mechanism driven by motivations (such as altruism, reciprocity, sense of mission, etc.) that differ from maximizing the selfish interests of a community member. Hence, an implicit definition of the community in Ogaki and Ohtake (2019) would be a group of individuals for whom such motivations work. In the case of caregivers receiving lower wages than labor market wages, for example, the motivation of caregivers may be related to a consideration of others' needs.

[1] Fehr and Schmidt (1999, p.822) argue that in a laboratory experiment "*it is natural to assume that the reference group is simply the set of subjects playing against each other and that the reference point, i.e., the equitable outcome, is given by the egalitarian outcome*."

In this dissertation, the community is defined as "people living in one particular area or people who are considered as a unit because of their common interests, social group, or nationality."[2] According to this definition, families, neighborhoods, and the entire nation are regarded as different levels of the community.

The Notability of the Community in ICT Revolution, the Aging Society, and Post-disaster Cooperation

Rajan (2019) emphasizes that the noteworthiness of the community is that it provides pre-market support; in other words, it prepares individuals to participate in markets through education, training, etc. Additionally, the community provides and augments post-market support such as safety nets beyond the ones provided by the state – for example, in case of unemployment due to technology shock, the great recession, misfortune, etc. The Information and Communications Technology (ICT) revolution caused the markets to find efficient ways of generating greater profits by displacing routine jobs with automation and computerization, and routine and non-routine jobs with trading. The phenomenon of polarization in the job market, with the increase in high-paying and low-paying occupations while occupations in the middle vanish, can be observed in the United States and other European countries. Consequently, advantageous communities flourish with the intervention of professional households in enhancing children's cognitive and non-cognitive abilities through pre-market support (better education and environment), while disadvantageous communities wither. With the stagnation of income, unemployment for many, and impending intergenerational social immobility, individuals have the tendency to become anti-rich, anti-trade, anti-immigration, and populist in order to protect local jobs. However, Rajan argues for the decentralization of power to the communities and enhancement of the community's

[2] Cambridge Dictionary: https://dictionary.cambridge.org/dictionary/english/community, retrieved on October 4, 2019.

pre-market as well as post-market support for the ICT revolution, among other practices; in other words, he supports the restoration of balance among the state, markets, and the community.

The examples mentioned in Ogaki and Ohtake (2019) suggest that, since legislation and funding for daycare center and nursing homes are provided by the public sector, the community is important for maintaining the quality of care services, as the markets alone are incapable of balancing profits and social responsibilities for children or older people with dementia. Countries with severely low fertility and rapidly ageing populations like Japan may benefit from training for altruistic and reciprocal behavior that would benefit other members in the community. This would prepare such countries for further decline in cognitive ability in the future.

In the case of natural catastrophes, the public sector arranges for rescue, shelters, relief goods, etc. To remedy this situation, victims living in shelters cooperate with each other, performing altruistic or reciprocal acts in the community by providing informal post-disaster management, compensation, and recovery.

Previous literature shows the community's impact on economic outcomes. For example, the neighborhood, one of the most conventional communities, impact children's long-term outcomes (Chetty and Hendren, 2018a, 2018b), subjective well-being (Clark et al., 2009; Luttmer, 2005; Sági, 2011), health (Robert, 1998; Ross and Mirowsky, 2001), etc. Some studies note that work colleagues, a common community in the workplace, are rather important for the purpose of income comparison (Clark and Senik, 2010; Mayraz et al., 2009). Additionally, there is empirical evidence demonstrating the correlation of subjective well-being within a family (Bruhin and Winkelmann, 2009; Schwarze and Winkelmann, 2011; Winkelmann, 2005), the smallest unit of the community.

Empirical Evidence for Other-regarding Preferences

According to several empirical studies, the dominant and most conventional way to explain the community's impact on economic outcomes is that individuals have other-regarding preferences.

Empirical evidence from laboratory experiments, such as the ultimate game (Cameron, 1999), dictator game (Hoffman et al., 1996), public goods game (Fehr and Gächter, 2000), trust game (Fahr and Irlenbusch, 2000), and repeated helping game (Engelmann and Fischbacher, 2009; Seinen and Schram, 2006), indicates that individuals display other-regarding preferences, and a model with purely self-regarding preferences is unable to explain many of the experimental results.[3]

Many other aspects provide evidence for other-regarding preferences. For example, one of the explanations for the Easterlin Paradox (Easterlin, 1974, 1995) is relative income concern, wherein individuals are happy when they have a high personal income and feel upset when others' incomes increase (reference income). The relative payoffs associated with subjective well-being have been observed in many empirical studies (e.g. Clark and Oswald, 1996). Dunn et al. (2008) unveil the positive impact of prosocial spending on happiness and peoples' neglect of the utility increases from prosocial spending. Additionally, Aknin et al. (2012) find a virtuous circle for prosocial spending and subjective well-being.

The survey data used in this dissertation's empirical analysis is based on Osaka University's Preference Parameters Study (PPS). This panel survey, which employs two-stage stratified random sampling, has been conducted in Japan since 2003. In the first stage, all the cities are placed into 10 regions: Hokkaido, Tohoku, Kanto, Koshinetsu, Hokuriku, Tokai, Kinki, Chugoku, Shikoku, and Kyushu. In the second stage, the cities in each region are categorized into four types according to size, ordinance designation, population of 100000 or more, population less than 100000, and towns and villages. In total, there are 40 strata. In each stratum, men and women aged 20–69 years are drawn from the population. The sample source is collected from the Basic Resident Register (*Jumin Kihon Daicho*). The survey has also been conducted in the United States by Osaka University since 2005 by employing random sampling based on age, gender, and race-

[3] Self-regarding preferences are one of the paramount assumptions in traditional economics.

ethnicity and sampling men and women aged 18 to 99-years-old from all states except Alaska and Hawaii. The sample source was collected from the "TNS MySurvey Panel." Finally, in 2009, fresh samples were selected and added for both the United States and Japan.

Chapter 2 discusses reference groups and the community that matters to individuals for a comparison of the standard of living. This chapter empirically investigates who is chosen as the reference group in a standard of living comparison and how it is chosen in the United States and Japan. The results show that most people will compare themselves to their neighbors instead of to the average person in the nation (which is often assumed in the macro and finance literature) or work colleagues and friends (reference groups in income comparison studies). In addition, this chapter tests the reference group's influence on the standard of living. With socio-economic variables being controlled, the relative standard of living of those who compare themselves to their neighbors is higher than those who compare themselves to classmates, relatives, the families of their children's classmates, and friends in the United States, as well as to relatives and the families of their children's classmates in Japan.

Chapter 3 examines parents' altruistic and self-interested bequest motives toward children within the family community. This chapter first analyzes which (and how) socio-economic variables such as gender, age, and household income affect bequest motives within the family community in the United States and Japan. Then, this chapter uses the Blinder-Oaxaca decomposition method to examine the extent to which endowment differences and the coefficients of these variables contribute to inter-country differences. Evidence from inter-country differences in bequest motives reveals that there is a statistically significant difference in the context of altruism in bequest motive between the two countries when several socio-economic variables are controlled for, and the difference is mainly explained by the coefficient effect. The gaps in the coefficients of total effect of life expectancy, "Age 65 and above" dummy, "Log of Household Income," and "Strong faith" shrink the gap, while the gaps in the coefficients of "Female Dummy" and "Number of Children" tend to expand the gap in altruism between the two countries. Given

these results and differences in the financial saving motives between the two countries, there are two possible reasons why the Japanese are more self-interested in terms of bequest motives: 1) they are more apprehensive than Americans in the sense that more Japanese parents save for precautionary reasons and for "nursing care." This is especially true for Japanese women, who save for these reasons more so than American women do; 2) they are more likely to implement human capital investments and *inter vivos* transfers because Japanese parents more often save for their children's education and marriages than do American parents.

Chapter 4 investigates community-based indirect reciprocity within a family in Japan over three generations: the respondent's parents and parents-in-law, the respondent and his/her spouse, and the respondent's child(ren). The community in this chapter is identified by consanguineal kinship within the family. This chapter proposes a theoretical model, called the community-based family tradition, in which the individual's utility positively depends on personal consumption and the family tradition of bequeathing an inheritance to a child and spouse; the model suggests that the source of the inheritance impacts the amount of the bequest left to one's children or one's spouse, which cannot be observed in either the pure altruistic or pure joy of giving models. The empirical results from the Partial Proportional Odds regression suggest that with some socio-economics characteristics controlled, those who have received an inheritance from their own parents are more likely to intend to leave as much as possible to their children, and those who have received an inheritance from their spouse's parents are more likely to intend to leave as much as possible to both their children and their spouse. Hence, the source of inheritance does affect bequest attitudes, which suggests that individuals are influenced by community-based indirect reciprocity. The empirical results derived from gender comparisons suggest that females are more likely to assign higher weights to the child and the spouse in the Spouse's Parents-Spouse-Child community or higher family tradition to the child and the spouse than males.

The dissertation is organized as follows. Chapter 2 discusses the type of community that matters for comparisons of individuals' standard of living. Chapter 3 and Chapter 4 extend to two (parents

and children) and three generations (grandparents, parents, and children), and examine altruistic bequest motive and attitudes within the family community. Chapter 5 presents the conclusion and discussion.

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Chapter 2.
Who are the Joneses You are Keeping up with?
A Study about how Reference Groups are Determined[4]

Abstract

This study empirically investigates who is chosen as the reference group in a standard of living comparison and how it is chosen in the United States and Japan. The results show that most people will compare themselves to their neighbors instead of to the average person in the nation (which is often assumed in the macro and finance literature) or work colleagues and friends (reference groups in income comparison studies). In addition, this paper tests the influence of the reference group itself on the standard of living.

Keywords: Reference Groups; Relative Standard of Living; Routine Standards

JEL classification: C25, D90, I31

[4] This chapter is an amended version of the published manuscript: Zhou, M. (2018). Who are the Joneses You are Keeping up with? *Economics Bulletin*, 38(3), 1261–1266.

2.1. Introduction

People will inevitably compare with others to measure their opinions and abilities (Festinger, 1954). Especially when objective measurement does not work, reference groups will be used for self-evaluation, self-enhancement, and self-improvement (Guimond, 2006).

Fehr and Schmidt's theoretical model (1999) presumes that people's behavior and subjective well-being are affected by relative payoffs. The importance of relative payoffs associated with subjective well-being has been observed in many empirical researches (Clark and Oswald, 1996; Clark and Senik, 2010; Clark et al., 2013, 2009; Ferrer-i-Carbonell, 2005; Knight et al., 2009; Mayraz et al., 2009; McBride, 2001; Yamada and Sato, 2013).

What kind of relative indicators have been used in economics? In general, there are three ways to define the relative indicators in previous literature: macroeconomic indicators (Abel, 1990; Campbell and Cochrane, 1999; Duesenberry, 1949; Easterlin, 1974, 1995; Easterlin et al., 2010; Gali, 1994; Tella et al., 2003), the indicators generated from those in similar socio-economic groups (Clark and Oswald, 1996; Clark et al., 2009; Ferrer-i-Carbonell, 2005; McBride, 2001; Pérez-Asenjo, 2011), and the indicators generated from self-reported reference groups (Clark and Senik, 2010; Clark et al., 2013; Knight et al., 2009; Mangyo and Park, 2011; Mayraz et al., 2009; Neumark and Postlewaite, 1998; Yamada and Sato, 2013).

What kind of reference groups have been used in economics, and which is more crucial? This paper defines two types of reference groups: objective reference groups and subjective reference groups.[5] Objective reference groups are those that people compare to with given socio-economic characteristics, such as similar age, similar educational attainment, same occupation, in the same organization, etc. Using macroeconomic indicators implicitly assumes that people are taking the whole nation as the reference group. As a result, the nationwide comparison is a kind of objective reference group as well. Subjective reference groups are those that individuals socially interact

[5] The names of objective and subjective reference groups stemmed from objective and subjective status in psychology introduced by Hyman (1942).

with.[6] The subjective ones mainly refer to self-reported reference groups in an interview or a survey, such as neighbors, friends, relatives, classmates, etc. Mangyo and Park (2011) mentioned that the reference groups that people frequently socialize with are more salient, which suggested that subjective reference groups may be much more essential because these kinds of reference groups are the ones people associate with.

Why is the study of the reference groups prominent? Firstly, the questions of whom individuals compare to and how they compare to such peer groups in economics are still shrouded in mystery. Without knowing the peer group, the calculation of the variables related to the word "relative" is dubious. Secondly, what Hyman (1942) found suggested that under disparate dimensions, people would compare to diverse peer groups, which implies that the reference groups in income comparison (Clark and Senik, 2010; Clark et al., 2013; Yamada and Sato, 2013) might not be held in standard of living (SOL) comparison. Besides, SOL is a much more general and overall evaluation of living circumstance. Additionally, the comparison direction, which refers to the reference group itself, has an impact on happiness (Clark and Senik, 2010).

This is the first study that will reveal the self-reported reference groups in SOL comparison in the United States and Japan, and test how people will choose such specific reference groups. The results show that the most cited reference group is one's neighbor. There are 16.3% Americans and 13.9% Japanese comparing to the average person in the United States and Japan, respectively. Contrary to what the previous literature found in income comparison, employees are the fourth and the second largest reference groups in the United States and Japan, respectively. Therefore, it is inappropriate and incongruous to use macroeconomics indicators and income's reference groups as the reference groups of SOL. Japanese and females are less likely to do nationwide comparisons than Americans and males. The Blinder-Oaxaca decomposition (Blinder, 1973; Oaxaca, 1973) reveals that the significant gap in country and gender of the mean of those who

[6] Clark et al. (2009) categorized the reference groups into the one that individuals interact with and the other that is similar to them.

compare nationwide is mainly explained by the coefficients instead of the endowments, and the significant gap in country of the mean of those who compare with neighbors is mainly explained by the endowments instead of the coefficients. Then, I apply the routine standards to verify the explanation for the determination of the reference groups. From the information accessibility prospect, the SOL of a neighbor is much easier to observe than that of other work colleagues. The empirical evidence indicates that those who are working for a company and full-time workers are more likely to compare to other workers to neighbors. The routine standards activate because full-time employees compare to or are compared to other colleagues more often than part-time ones. In addition, the result demonstrates that those who compare themselves with their neighbors evaluate their relative standard of living (RSOL) as higher than do those who compare to relatives and families of your children's classmates.

This study is organized as follows. Section 2.2 describes the data used to present empirical results. Section 2.3 describes the direction (compares to whom) and determination (who will or will not compare to whom) of the reference groups, and interpretation about why people choose their reference groups. Section 2.4 shows the impact of reference groups on the relative standard of living. Section 2.5 concludes and discusses.

2.2. Data

The Preference Parameters Study of Osaka University is used in this research. This panel survey has been conducted in Japan since 2003 and in the United States since 2005 by the Institution of Social and Economic Research of Osaka University, using a random sample drawn from 20—69 years old in Japan and 18—99 years old in the United States. The latest fresh samples were selected in 2009 in both countries.

The 2011 wave data sets of the US and Japan are used in this paper. There are two main questions in the questionnaire that will be used in the analyses. Taking the US 2011 Preference Parameters Study as an example, question 15 asked "How does your standard of living compare

with that of the people around you? (X ONE Box)" followed by the question "In Q.15, with whom did you compare your standard of living? (X ONE Box)" The respondents could select one and only one among the following 13 reference groups listed in the questionnaire (see Appendix 2-1A).

2.3. Direction and Determination of Reference Groups

2.3.1. Who Are the Joneses in the Standard of Living Comparison?

Table 2-1 shows the distribution of the reference groups (Appendix 2-1B shows corresponding figures). Over 35% of respondents compare SOL to neighbors in the United States and Japan. The average person in the nation is the second major comparison subject in the United States and the third in Japan. For both males and females in the United States and Japan, most compare to their neighbors rather than to the average person in the nation. There are some obvious distinctions in gender for reference groups. More American and Japanese men than women compare to classmates and other workers, and more American and Japanese women than men compare to relatives and friends. There is an exceptionally high percentage of Japanese females who compare to "Families of your children's classmates" (hereafter "FCC").[7] This can be explained by the "mama caste" (*mama kasuto* in Japanese)[8] of mothers whose children are friends or classmates. Statistically, there is a significant difference in reference groups over gender in the United States and Japan.

Table 2-1 Here

[7] The Japanese word, "mama-tomo" (mama-friends in English), exists to describe this unique and special type of relationship in Japan. For most families in Japan, mothers are responsible for picking up children, and they become mama-tomo simply because their children are friends or are in the same class. However, mama-tomo are not necessarily friends outside of this community.

[8] "Mama caste" refers to a kind of ranking system, which is ranked by household income, children's learning ability, husband's occupation, etc.

Appendix 2-1C shows that the most cited reference group is always "Neighbor" from 2008 to 2012. Even if an individual's choice varies over years, the distribution's ranking of reference groups of the whole sample does not change a lot.

2.3.2. Who Will/Will Not Compare to the Whole Nation or Neighbor?

Table 2-2 presents the summary statistics of the dependent and independent variables in the regression. The question "Approximately how much was the annual earned income before taxes and with bonuses included of your entire household for 2010?" is used to estimate annual household income; the answers are reported in 12 categories. This study uses the mid-point of each income category and assign a value of half of the upper bound for the lowest category (5,000 USD and 500,000 JPY) and 1.5 times of the lower bound for the highest category (300,000 USD and 30,000,000 JPY). The value in JPY is converted into USD by using 2010 Purchasing power parities (PPP) from OECD (2019) (1 USD=111.67 JPY). The household income in 2010 is taken as a natural logarithm in the analysis.

Table 2-2 Here

Assume that individuals compare themselves to those with whom they interact socially; then the model that determines reference groups will depend on an individual's socio-economic characteristics such as age, gender, marital status, and so on.

$$RG_i = \alpha + \beta \times Country_i + Country_i \times \gamma' \times \boldsymbol{X_i} \quad (2\text{-}1)$$

where RG_i is the reference group for individual i, $Country_i$ is where individual i lives, and $\boldsymbol{X_i}$ is the vector of socio-economic characteristics.

Table 2-3 presents coefficients and marginal effects of probit regression by taking those who choose to compare nationwide or to neighbors as "1," and those who choose the other 12 reference groups as "0."

Table 2-3 Here

Columns (1) and (2) of Table 2-3 show that Japanese, females, individuals from rich families, those who are younger than 35 years old, and less-educated individuals are less likely to compare to the average person in the nation than are Americans, males, the poor, those who are above 35 years old and those who have graduated from college or beyond, respectively. Columns (3) and (4) of Table 2-3 show that those who are younger than 35 years old and the single are less likely to compare to their neighbors.

To explore in detail the differences for those who will compare to the average person in their country and neighbors, I use the Blinder–Oaxaca decomposition based on the linear probability regression.[9]

The raw difference between the US and Japan in reference group (RG=Nation or Neighbor) is equal to:

$$\Delta RG = E(X_{US})'\beta_{US} - E(X_{JP})'\beta_{JP} \tag{2-2}$$

where X is the vector of socio-economic characteristics in equation (2-1) and β is the vector of coefficients. The difference (equation (2-2)) can be decomposed as:

$$\begin{aligned} \Delta RG \quad = \quad & \{E(X_{US}) - E(X_{JP})\}'\beta_{JP} \\ & + E(X_{JP})'(\beta_{US} - \beta_{JP}) \\ & + \{E(X_{US}) - E(X_{JP})\}'(\beta_{US} - \beta_{JP}) \end{aligned} \tag{2-3}$$

The first component of equation (2-3),

$$\{E(X_{US}) - E(X_{JP})\}'\beta_{JP},$$

represents the "endowment effect," measuring the expected change in Japan's mean outcome if the Japanese had Americans' characteristics. The second component,

$$E(X_{JP})'(\beta_{US} - \beta_{JP}),$$

represents the "coefficient effect," measuring the expected change in Japan's mean outcome if the Japanese had the coefficients of the American sample. The third component,

$$\{E(X_{US}) - E(X_{JP})\}'(\beta_{US} - \beta_{JP}),$$

[9] The empirical analysis was conducted in Stata and followed the same procedures as the ones used in Jann (2008).

represents the "interaction effect," measuring simultaneous effect from endowment and coefficients between the US and Japan.

Similarly, the raw difference between the males and females in reference group (RG=Nation or Neighbor) is equal to:

$$\Delta RG = E(X_m)'\beta_m - E(X_f)'\beta_f \tag{2-4}$$

where X is the vector of socio-economic characteristics in equation (2-1) and β is the vector of coefficients. The difference (equation (2-4)) can be decomposed as:

$$\begin{aligned} \Delta RG \quad = \quad & \{E(X_m) - E(X_f)\}'\beta_f \\ & + E(X_f)'(\beta_m - \beta_f) \\ & + \{E(X_m) - E(X_f)\}'(\beta_m - \beta_f) \end{aligned} \tag{2-5}$$

The first component of equation (2-5),

$$\{E(X_m) - E(X_f)\}'\beta_f,$$

represents the "endowment effect," measuring the expected change in the females' mean outcome if females had the males' characteristics. The second component,

$$E(X_f)'(\beta_m - \beta_f),$$

represents the "coefficient effect," measuring the expected change in the females' mean outcome if females had the coefficients of the males' sample. The third component,

$$\{E(X_m) - E(X_f)\}'(\beta_m - \beta_f),$$

represents the "interaction effect," measuring simultaneous effect from endowment and coefficients between the males and females.

Table 2-4 provides the Blinder-Oaxaca decomposition based on linear probability regression (Appendix 2-2A and Appendix 2-2B provide results in detail.) The mean of those who compare to the average person in the nation is 0.1616 for the United States and 0.1377 for Japan, with a significant gap of 0.0239. The differences in coefficients account for 109% of the gap. The mean of those who compare to the average person in the nation is 0.1694 for males and 0.1314 for females, with a significant gap of 0.0381. The differences in coefficients account for 100% of the

gap. Concurrently, the mean of those who compare to neighbors is 0.3480 and 0.3758 for the United States and Japan, respectively, with a significant difference of 0.0278. Over 100% of the difference is explained by the endowments, and there is no significant gap between males and females.

Table 2-4 Here

Table 2-5 shows the results of multinomial logit regression with all the same independent variables in Table 2-3 controlled and the "Neighbor" category omitted. Japanese, relative to Americans, are more likely to compare to workers than to neighbors, but less likely to compare to the average person in the nation and others than to neighbors. Females are less likely than males to compare to the average person in the nation than to neighbors. Japanese females are less likely to compare to workers than are Japanese males, but American females are more likely than are American males. As age increases, people are more likely to compare to their neighbors. Less educated people are more likely to compare to neighbors to the average person in the United States and Japan. In general, singles are less likely to compare to neighbors than married individuals or the ones in any other marital status.

Table 2-5 Here

2.3.3. How Do We Choose to Whom We Compare?

In income comparisons, the most cited reference groups in European countries are work colleagues and in Japan, friends (Clark and Senik, 2010; Clark et al., 2013; Yamada and Sato, 2013).[10] In previous sections, the results demonstrated that the majority of Americans and Japanese choose neighbors as reference groups in SOL comparisons instead of colleagues or friends. Why is the direction of comparison different? As I have mentioned before, one possible explanation is that the questionnaire is asking about SOL, which focuses not only on income but

[10] European Social Survey includes "Work colleagues/Family members/Friends/Others/Don't compare/Not applicable/Don't know." Internet-based survey conducted in Japan by Nikkei includes "Family/Neighbors/Friends/Colleagues/Do not care/Others."

also implies comparison in consumption, leisure, daily life, etc. Under this different comparison dimension, people will choose different reference groups, which is consistent with Hyman's finding. Furthermore, from the information accessibility prospect, everyday life has provided much opportunity to observe one's neighbor's SOL than one's colleagues or friends.

This brings us to another question: since it is easier to compare to neighbors than to work colleagues toward SOL, why do more than 10% of Americans and Japanese choose work colleagues as the reference groups for SOL comparison? One explanation is the concept of routines. Betsch et al., (2002) define the routine as the "*option that comes to mind as a solution when the decision maker recognized a particular decision problem.*" Instead of considering all the possible alternatives, people will pick the solution that matches the problem in terms of the application of the routines as a more efficient way (Betsch et al., 2002; Guimond, 2006). Mussweiler and Rüter (2003) define the routine standard as a checkpoint that has been used frequently and spontaneously for social comparison and they show the evidence of the implementation of the routine standard in self-evaluation.

As a result, we compare with or are compared to our work colleagues unintentionally and frequently in the workplace all the time, and people follow this routine in selecting the reference group of SOL. Consequently, I assume that those who are working for a company, or are full-time workers, are more likely to compare to the workers than to neighbors (For example, Appendix 2-3 shows corresponding figures for Table 2-1 among full-time workers).

Table 2-6 Here

Table 2-6 provides the results based on Multinomial Logit regression (Appendix 2-4 provides selected summary statistics). With all the independent variables controlled in Table 2-5, Panel A of Table 2-6 verifies the assumption that for those who are working for a company and full-time workers are more likely to compare to workers than are those who are not employed. The self-employed are less likely to compare to workers, which is consistent with the result in income comparison (Clark and Senik, 2010). Panel B of Table 2-6 demonstrates that

housewives/househusbands and the retired are less likely to compare to workers than to neighbors in both the United States and Japan, as well as unemployed Americans. The result is compatible with the routine standards explanation.

2.4. Reference Groups and Relative Standard of Living

How does your standard of living compare with that of the people around you? More than half of Japanese and Americans will say "Theirs is about the same as mine" (See Appendix 2-5). On average, individuals think their own RSOL is lower than their reference groups' (See Table 2-1).[11]

Table 2-7 Here

Clark and Senik (2010) show that happiness is affected by the comparison direction. Table 2-7 shows the result of RSOL based on ordered probit regression. The dependent variable, RSOL, equals 1 when the respondent's RSOL is lower than their reference groups', and it equals 5 when the respondent's RSOL is higher. For individuals from rich families and those who have finished college or beyond, they rate their RSOL higher than those who are needy or less educated. Compared to the other occupation, Japanese housewives or househusbands and retirees rate higher. Both in the United States and Japan, the RSOL of the unemployed will be lower than those in any other occupation category. With socio-economic variables being controlled, the RSOL of those who compare themselves to their neighbors is higher than those who compare themselves to classmates, relatives, FCC, and friends in the United States, as well as to relatives and FCC in Japan. Therefore, the RSOL will be affected by the reference groups you chose. The respondents' RSOL is lower than their reference groups' RSOL on average, and those who compare themselves to their neighbors will have slightly higher RSOL.

[11] Please note that the RSOL is ordinal variables.

2.5. Conclusion and Discussion

This study discussed the reference groups, the community that matters to individuals for the standard of living comparison, and the influence of the reference group itself on the standard of living.

In the data, most people were comparing with their neighbors, just as in the idiom "keeping up with the Joneses." Unlike how previous literature in macroeconomics and finance implicitly assumed that the Joneses are ordinary people across the country or work colleagues and friends in income comparison, this paper provided the evidence that a subjective reference group, the neighbor, is what most people literally compare with. Furthermore, there were country differences, gender differences, and other socio-economic characteristic differences in selecting reference groups. This paper also suggested the application of routine standards in the selection of reference groups in relative standard of living. Finally, this paper showed that those who compare themselves to their neighbors will have slightly higher RSOL.

Just as what the temporal comparison (Albert, 1977) in psychology mentioned, internal habit formation model suggested that individuals would compare to their old selves as well. Therefore, the reference groups could be widely explored as present objective reference groups, present subjective reference groups, past objective reference groups, past subjective reference groups, and the past self, which leaves us a new perspective to solve the economic puzzles.

Chen and Ludvigson (2009) examined two hypotheses about the linear or nonlinear, internal or external habit formation model by analyzing the real per-capita consumption and real asset returns where the habit is from the self if it is internal or from objective reference groups if external.[12] However, in Section 2.3 of this paper, the empirical results had shown that most Americans and Japanese compare to their neighbors, hence the great interest in applying the consumption from subjective reference groups as the "external."

[12] Here, the "internal" refers to the past self, and the "external" depends on present or past objective reference groups and subjective reference groups.

For further research, one possible question to investigate is whether or not the reference group itself affects one's consumption or saving behaviors, just as it influences happiness and relative standard of living.

2.6. Reference

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Table 2-1 The Distribution of Reference Groups and the Mean of Relative Standard of Living

	The Unites States								
	All			Female			Male		
	Obs.	Percent	RSOL	Obs.	Percent	RSOL	Obs.	Percent	RSOL
Neighbor	1,662	35.10	2.84	907	34.88	2.80	755	35.36	2.90
Classmate	219	4.63	2.69	100	3.85	2.77	119	5.57	2.62
Relative	611	12.90	2.72	380	14.62	2.69	231	10.82	2.76
FCC	94	1.99	2.85	64	2.46	2.86	30	1.41	2.83
Worker	519	10.96	2.92	278	10.69	2.87	241	11.29	2.98
Nation	771	16.28	2.80	377	14.50	2.71	394	18.45	2.89
Friend	514	10.86	2.75	308	11.85	2.73	206	9.65	2.78
Others	345	7.29	2.80	186	7.15	2.81	159	7.45	2.79
Total	4,735	100.00	2.81	2,600	100.00	2.77	2,135	100.00	2.86

	Japan								
	All			Female			Male		
	Obs.	Percent	RSOL	Obs.	Percent	RSOL	Obs.	Percent	RSOL
Neighbor	1,828	37.53	2.72	963	37.05	2.71	865	38.07	2.74
Classmate	528	10.84	2.66	251	9.66	2.65	277	12.19	2.66
Relative	281	5.77	2.58	195	7.50	2.58	86	3.79	2.58
FCC	392	8.05	2.56	325	12.50	2.55	67	2.95	2.61
Worker	836	17.16	2.72	340	13.08	2.64	496	21.83	2.77
Nation	677	13.90	2.72	312	12.00	2.66	365	16.07	2.76
Friend	232	4.76	2.63	159	6.12	2.62	73	3.21	2.67
Others	97	1.99	2.63	54	2.08	2.69	43	1.89	2.56
Total	4,871	100.00	2.69	2,599	100.00	2.65	2,272	100.00	2.73

Notes:
1. “FCC” represents “Families of your children’s classmates.”
2. “Worker” includes “Worker in your company who is in your age group, has similar academic background, or who started working in the same year,” “Worker in your company who is assigned to a similar job as yours, regardless of their age, academic background, year he or she joined the company,” “Worker in another company in the same industry who belongs to the same age group, has similar academic background, or who started working in the same year,” and “Worker in another company in the same industry who is assigned to a similar job as yours, regardless of his or her age, academic background, and year he or she joined a company.”
3. “Nation” represents “Average person in the US” for the US survey and “Average person in Japan” for the Japan survey.
4. “Others” includes “Average person in the world,” “Others,” and “I don’t know.”
5. “RSOL” represents relative standard of living, by taking the mean of the question ‘how does your standard of living compare with that of the people around you’ (Here the value has been recoded as 1 representing “Theirs is much higher than mine” and 5 representing “Theirs is much lower than mine”) for each reference group.
6. Excluding those who have no children but chose “Families of your children’s classmates,” and those who did not answer the previous question, “How does your standard of living compare with that of the people around you?”

Table 2-2 Summary Statistics

		All		US		Japan	
Variable	Definition	Mean	S.D.	Mean	S.D.	Mean	S.D.
COUNTRY	Country Dummy (1=Japan, 0=US)	0.52	0.50				
Nation	Reference Group Dummy: Average person in US/Japan	0.15	0.36	0.16	0.37	0.14	0.34
Neighbor	Reference Group Dummy: Neighbor	0.36	0.48	0.35	0.48	0.38	0.48
FEMALE	Female Dummy	0.53	0.50	0.54	0.50	0.53	0.50
HHINC	Approximately how much was the annual earned income before taxes and with bonuses included of your entire household for 2010?	10.74	0.83	10.74	0.97	10.74	0.68
UNDER35	Age Group Dummy: Under 35 years old	0.13	0.33	0.17	0.37	0.09	0.29
AGE35-59	Age Group Dummy: Aged 35 to 59	0.53	0.50	0.49	0.50	0.56	0.50
ABOVE60	Age Group Dummy: Above 60 years old	0.35	0.48	0.35	0.48	0.35	0.48
NOHIGH	Education Dummy: Did not finish high school	0.07	0.26	0.04	0.20	0.10	0.30
HIGHSCH	Education Dummy: Graduate from high school but not graduate from college	0.62	0.49	0.58	0.49	0.65	0.48
COLLEGE	Education Dummy: Graduate from college or higher	0.31	0.46	0.38	0.49	0.25	0.44
MARRIED	Marital Status Dummy: Have a spouse (husband or wife, including common-law marriage)	0.71	0.46	0.60	0.49	0.81	0.39
SINGLE	Marital Status Dummy: Have never married	0.16	0.37	0.22	0.41	0.11	0.31
OTHERMARSTA	Marital Status Dummy: Others (currently unattached, having divorced or separated, or an unattached widow or widower)	0.13	0.34	0.18	0.39	0.08	0.27
Observations		8,346		4,017		4,329	

Note: Annual household income in 2010 was reported in 12 categories. I use the mid-point of each income category and assign a value of half of the upper bound for the lowest category (5,000 USD and 500,000 JPY) and 1.5 times of the lower bound for the highest category (300,000 USD and 30,000,000 JPY). The value in JPY is converted into USD by using 2010 Purchasing power parities (PPP) from OECD (2019) (1 USD=111.666587 JPY). The household income in 2010 is taken as a natural logarithm in the analysis. Please note that the results are robust if using 2010 yearly average exchange rates of TTM from Mitsubishi UFJ Financial Group (1 USD=80.59 JPY).

Table 2-3 Who Will Compare to the Average Person in the Nation and Neighbors (Probit Regression)

	Nation		Neighbor	
	(1) Coef.	(2) Margins	(3) Coef.	(4) Margins
COUNTRY	0.2424	-0.0213***	-1.0280**	-0.0121
	(0.52)	(0.01)	(0.45)	(0.01)
FEMALE	-0.1890***	-0.0384***	-0.0198	-0.0064
	(0.05)	(0.01)	(0.04)	(0.01)
HHINC	-0.0597**	-0.0154***	-0.0322	-0.0016
	(0.03)	(0.01)	(0.02)	(0.01)
Age Group (omitted: UNDER35)				
AGE35-59	0.1964**	0.0355***	0.3827***	0.1528***
	(0.08)	(0.01)	(0.07)	(0.02)
ABOVE60	0.4032***	0.0788***	0.4259***	0.2519***
	(0.09)	(0.01)	(0.08)	(0.02)
Education (omitted: COLLEGE)				
NOHIGH	-0.1206	-0.0412**	0.0173	0.0561**
	(0.13)	(0.02)	(0.11)	(0.03)
HIGHSCH	0.0448	-0.0171*	-0.0505	0.0026
	(0.05)	(0.01)	(0.05)	(0.01)
Marital Status (omitted: SINGLE)				
MARRIED	-0.0125	-0.0078	0.3256***	0.1226***
	(0.07)	(0.01)	(0.06)	(0.02)
OTHERMARSTA	-0.0055	0.0091	0.2332***	0.0759***
	(0.09)	(0.02)	(0.08)	(0.02)
Interactions				
Japan × FEMALE	0.0460		0.0051	
	(0.07)		(0.06)	
Japan × HHINC	-0.0131		0.0539	
	(0.05)		(0.04)	
Japan × AGE35-59	-0.0378		0.1804	
	(0.13)		(0.12)	
Japan × ABOVE60	-0.0932		0.5970***	
	(0.14)		(0.12)	
Japan × NOHIGH	-0.1243		0.2525*	
	(0.16)		(0.13)	
Japan × HIGHSCH	-0.2261***		0.1109	
	(0.08)		(0.07)	
Japan × MARRIED	-0.0410		0.0410	
	(0.11)		(0.10)	
Japan × OTHERMARSTA	0.0836		-0.0230	
	(0.15)		(0.13)	
Constant	-0.5079		-0.5904**	
	(0.32)		(0.27)	
Observations	8346	8346	8346	8346
Pseudo R^2	0.0153		0.0412	

* p < 0.1, ** p < 0.05, *** p < 0.01. Robust standard errors in parentheses.

Table 2-4 Blinder-Oaxaca Decomposition (Linear Probability Regression)

Dependent Variable: Nation			
	US - Japan Comparison		
	US	Japan	Difference
Mean:	0.1616***	0.1377***	0.0239***
	(0.00)	(0.00)	(0.00)
Observation:	4017	4329	
Blinder-Oaxaca:	Endowments	Coefficients	Interaction
	30.54%	109.21%	-39.75%
	Male - Female comparison		
	Male	Female	Difference
Mean:	0.1694***	0.1314***	0.0381***
	(0.01)	(0.01)	(0.00)
Observation:	3901	4445	
Blinder-Oaxaca:	Endowments	Coefficients	Interaction
	-12.60%	100.00%	12.34%

Dependent Variable: Neighbor			
	US - Japan Comparison		
	US	Japan	Difference
Mean:	0.3480***	0.3758***	-0.0278***
	(0.00)	(0.00)	(0.00)
Observation:	4017	4329	
Blinder-Oaxaca:	Endowments	Coefficients	Interaction
	130.58%	14.75%	-44.96%
	Male - Female comparison		
	Male	Female	Difference
Mean:	0.3648***	0.3604***	0.0044
	(0.02)	(0.01)	(0.01)
Observation:	3901	4445	
Blinder-Oaxaca:	Endowments	Coefficients	Interaction
	-13.64%	227.27%	-113.64%

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.
Note: Independent variables of Blinder-Oaxaca decomposition are based on Table 2-3.

Table 2-5 With Whom Did You Compare Your Standard of Living? (Multinomial Logit Regression. Omitted Category: Neighbor)

	(1) All			(2) US			(3) Japan		
	Worker	Nation	Others	Worker	Nation	Others	Worker	Nation	Others
COUNTRY	1.6717***	0.8778*	0.9010***						
	(0.01)	(0.05)	(0.03)						
FEMALE	0.7445	0.7787***	1.3543*	1.0752***	0.7687***	1.1747***	0.5852***	0.8144***	1.5922***
	(0.21)	(0.02)	(0.21)	(0.01)	(0.00)	(0.01)	(0.01)	(0.03)	(0.04)
HHINC	1.3090***	0.9115*	0.9714	1.4319***	0.9498*	1.0239	1.2049**	0.8787	0.9001***
	(0.10)	(0.03)	(0.06)	(0.01)	(0.02)	(0.05)	(0.07)	(0.12)	(0.01)
Age Group (omitted: UNDER35)									
AGE35-59	0.6466***	0.7753	0.3799***	0.6389	0.8578	0.4274***	0.5457	0.5905	0.2765
	(0.03)	(0.13)	(0.07)	(0.16)	(0.10)	(0.11)	(0.26)	(0.35)	(0.26)
ABOVE60	0.2231***	0.7847	0.2491**	0.2844***	1.1197**	0.4068***	0.1528***	0.4899	0.1296*
	(0.06)	(0.30)	(0.13)	(0.06)	(0.04)	(0.05)	(0.03)	(0.22)	(0.11)
Education (omitted: COLLEGE)									
NOHIGH	0.7985	0.6291**	0.7294	0.6157	0.8126*	1.1712	0.8839	0.5386***	0.5943
	(0.09)	(0.11)	(0.21)	(0.61)	(0.07)	(0.32)	(0.12)	(0.08)	(0.17)
HIGHSCH	0.9281*	0.9082	1.0706	0.9400*	1.1365	1.1373	0.9760	0.7049***	0.9878
	(0.03)	(0.22)	(0.08)	(0.03)	(0.15)	(0.14)	(0.08)	(0.03)	(0.01)
Marital Status (omitted: SINGLE)									
MARRIED	0.4537***	0.6510***	0.6061***	0.4268***	0.6758***	0.6046***	0.4502	0.5872	0.5799***
	(0.01)	(0.04)	(0.01)	(0.11)	(0.08)	(0.03)	(0.24)	(0.17)	(0.04)
OTHERMARSTA	0.5846***	0.8168**	0.7397***	0.5012***	0.7524***	0.7105*	0.6373*	0.8375*	0.6712*
	(0.07)	(0.05)	(0.00)	(0.05)	(0.01)	(0.12)	(0.14)	(0.06)	(0.10)
Constant	0.0767*	2.6225	4.5764	0.0231***	1.2006	2.1271	0.4320	6.1285	14.4394***
	(0.08)	(2.12)	(4.01)	(0.00)	(0.61)	(1.31)	(0.28)	(7.13)	(8.14)
Observations	8346			4017			4329		
Pseudo R^2	0.0411			0.0307			0.0539		

* p < 0.1, ** p < 0.05, *** p < 0.01. Coefficients are shown as Relative Risk Ratios.
Standard errors in parentheses are clustered by country for specification (1), clustered by the female dummy for specifications (2) and (3).
Note: "Others" category of reference groups includes "Classmate," "Relative," "FCC," "Friend" and "Others" in Table 2-1.

Table 2-6 With Whom Did You Compare Your Standard of Living? (Multinomial Logit Regression. Omitted Category: Neighbor)

	(1) All			(2) US			(3) Japan		
	Worker	Nation	Others	Worker	Nation	Others	Worker	Nation	Others
Panel A:									
WORKCOMP	2.7892***	2.3295*	2.6529	2.2522	1.3724	1.4092***	3.0482*	3.4369***	4.2373**
	(0.37)	(0.98)	(1.34)	(2.25)	(1.15)	(0.04)	(1.47)	(0.63)	(2.14)
SELF-EMPLOYED	0.3572***	0.8857	1.0934**	0.4059***	1.2465	1.1994***	0.3428	0.7482*	1.0774
	(0.02)	(0.19)	(0.03)	(0.02)	(0.26)	(0.01)	(0.20)	(0.09)	(0.30)
Employment Status (omitted: PART-TIME)									
FULL-TIME	1.5672***	0.9138**	0.8226***	1.5520***	0.9214	0.8861**	1.5908***	0.9962	0.8257***
	(0.02)	(0.03)	(0.03)	(0.04)	(0.18)	(0.04)	(0.01)	(0.01)	(0.04)
OTHEREMPSTA	1.4233	0.9214	0.8868***	0.3980***	0.7880***	0.9450	1.8351***	1.1190	0.9280
	(0.53)	(0.16)	(0.01)	(0.08)	(0.02)	(0.25)	(0.03)	(0.08)	(0.10)
Observations	4713			2027			2686		
Pseudo R^2	0.0421			0.0332			0.0545		
Panel B:									
WORKCOMP	3.2415***	1.6094***	1.0998	3.0744***	1.3342***	0.8479	3.1543***	1.6932***	1.2032***
	(0.04)	(0.14)	(0.15)	(0.54)	(0.10)	(0.09)	(0.53)	(0.05)	(0.07)
HOMEMAKER	0.2210***	1.1997**	1.3234	0.0000***	1.4126*	0.8409	0.2693***	1.1296**	1.5168***
	(0.07)	(0.08)	(0.27)	(0.00)	(0.23)	(0.20)	(0.02)	(0.05)	(0.11)
RETIRED	0.6608	1.5428***	1.3248	0.3550***	1.2368	0.9158	0.9062***	1.5180***	1.2730
	(0.28)	(0.10)	(0.19)	(0.10)	(0.32)	(0.33)	(0.00)	(0.19)	(0.65)
UNEMPLOYED	0.6251*	1.7052***	1.3193**	0.4448***	1.6580	1.2097	0.7023	1.4562***	1.0878
	(0.12)	(0.17)	(0.12)	(0.00)	(0.51)	(0.53)	(0.29)	(0.13)	(0.56)
Observations	7170			3176			3994		
Pseudo R^2	0.0577			0.0467			0.0706		

* p < 0.1, ** p < 0.05, *** p < 0.01. Coefficients are shown as Relative Risk Ratios.

Standard errors in parentheses are clustered by country for specification (1), clustered by the female dummy for specifications (2) and (3).

Notes:

1. "Others" category of reference groups includes "Classmate," "Relative," "FCC," "Friend" and "Others" of Table 2-1.
2. With COUNTRY, FEMALE, HHINC, Age Group Dummies, Education Dummies, Marital Status Dummies controlled.

Table 2-7 How Does Your Standard of Living Compare with That of the People Around You (Marginal Effects for Ordered Probit Regression)

	US				
	RSOL=1	RSOL=2	RSOL=3	RSOL=4	RSOL=5
FEMALE	0.0027	0.0044	-0.0019	-0.0042	-0.0010
	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)
HHINC	-0.0428***	-0.0687***	0.0303***	0.0649***	0.0162***
	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)
WORKCOMP	0.0112	0.0180	-0.0080	-0.0170	-0.0043
	(0.01)	(0.02)	(0.01)	(0.02)	(0.00)
HOMEMAKER	0.0198	0.0318	-0.0140	-0.0301	-0.0075
	(0.02)	(0.03)	(0.01)	(0.03)	(0.01)
RETIRED	-0.0047	-0.0075	0.0033	0.0071	0.0018
	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)
UNEMPLOYED	0.0478**	0.0768***	-0.0339**	-0.0726***	-0.0182**
	(0.02)	(0.03)	(0.01)	(0.03)	(0.01)
Age Group (omitted: UNDER35)					
AGE35-59	0.0112	0.0180	-0.0079	-0.0170	-0.0042
	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)
ABOVE60	0.0112	0.0181	-0.0080	-0.0171	-0.0043
	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)
Education (omitted: COLLEGE)					
NOHIGH	0.0013	0.0024	-0.0007	-0.0024	-0.0006
	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)
HIGHSCH	0.0166***	0.0277***	-0.0118***	-0.0261***	-0.0064***
	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)
Marital Status (omitted: SINGLE)					
MARRIED	0.0038	0.0064	-0.0025	-0.0061	-0.0016
	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)
OTHERMARSTA	0.0213**	0.0329**	-0.0167**	-0.0303**	-0.0072**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)
Reference Groups (omitted: Neighbor)					
Classmate	0.0475***	0.0658***	-0.0415**	-0.0588***	-0.0130***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.00)
Relative	0.0208**	0.0329**	-0.0155**	-0.0307***	-0.0075***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)
FCC	0.0284	0.0432*	-0.0224	-0.0398*	-0.0094**
	(0.02)	(0.02)	(0.02)	(0.02)	(0.00)
Worker	0.0000	0.0001	-0.0000	-0.0001	-0.0000
	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)
Nation	0.0006	0.0010	-0.0003	-0.0010	-0.0003
	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)
Friend	0.0232**	0.0362***	-0.0176**	-0.0337***	-0.0081***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)
Others	0.0073	0.0124	-0.0046	-0.0119	-0.0031
	(0.01)	(0.02)	(0.01)	(0.02)	(0.00)
Observations	3176				
Pseudo R^2	0.0496				

* p < 0.1, ** p < 0.05, *** p < 0.01. Robust standard errors in parentheses.

	Japan				
	RSOL=1	RSOL=2	RSOL=3	RSOL=4	RSOL=5
FEMALE	0.0052	0.0136	-0.0094	-0.0089	-0.0005
	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)
HHINC	-0.0554***	-0.1433***	0.0994***	0.0940***	0.0052***
	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)
WORKCOMP	-0.0059	-0.0152	0.0105	0.0100	0.0006
	(0.01)	(0.02)	(0.01)	(0.01)	(0.00)
HOMEMAKER	-0.0193**	-0.0498**	0.0346**	0.0327**	0.0018**
	(0.01)	(0.02)	(0.02)	(0.01)	(0.00)
RETIRED	-0.0169*	-0.0437*	0.0303*	0.0287*	0.0016
	(0.01)	(0.02)	(0.02)	(0.02)	(0.00)
UNEMPLOYED	0.0285*	0.0737*	-0.0511*	-0.0483*	-0.0027*
	(0.01)	(0.04)	(0.03)	(0.03)	(0.00)
Age Group (omitted: UNDER35)					
AGE35-59	0.0044	0.0115	-0.0080	-0.0075	-0.0004
	(0.01)	(0.02)	(0.01)	(0.01)	(0.00)
ABOVE60	-0.0213***	-0.0552***	0.0383***	0.0362***	0.0020**
	(0.01)	(0.02)	(0.01)	(0.01)	(0.00)
Education (omitted: COLLEGE)					
NOHIGH	0.0200***	0.0568***	-0.0364***	-0.0382***	-0.0022***
	(0.01)	(0.02)	(0.01)	(0.01)	(0.00)
HIGHSCH	0.0183***	0.0527***	-0.0332***	-0.0358***	-0.0020***
	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)
Marital Status (omitted: SINGLE)					
MARRIED	-0.0077	-0.0195	0.0141	0.0124	0.0007
	(0.01)	(0.02)	(0.01)	(0.01)	(0.00)
OTHERMARSTA	0.0017	0.0040	-0.0031	-0.0024	-0.0001
	(0.01)	(0.02)	(0.02)	(0.02)	(0.00)
Reference Groups (omitted: Neighbor)					
Classmate	0.0093	0.0241	-0.0170	-0.0156	-0.0008
	(0.01)	(0.02)	(0.01)	(0.01)	(0.00)
Relative	0.0136	0.0340*	-0.0249	-0.0216*	-0.0011*
	(0.01)	(0.02)	(0.02)	(0.01)	(0.00)
FCC	0.0228***	0.0532***	-0.0418***	-0.0326***	-0.0016***
	(0.01)	(0.02)	(0.02)	(0.01)	(0.00)
Worker	0.0010	0.0029	-0.0019	-0.0019	-0.0001
	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)
Nation	-0.0023	-0.0064	0.0040	0.0044	0.0003
	(0.01)	(0.02)	(0.01)	(0.01)	(0.00)
Friend	0.0106	0.0271	-0.0193	-0.0174	-0.0009
	(0.01)	(0.02)	(0.02)	(0.01)	(0.00)
Others	-0.0031	-0.0088	0.0055	0.0061	0.0004
	(0.01)	(0.04)	(0.02)	(0.03)	(0.00)
Observations	3994				
Pseudo R^2	0.0673				

* p < 0.1, ** p < 0.05, *** p < 0.01. Robust standard errors in parentheses.

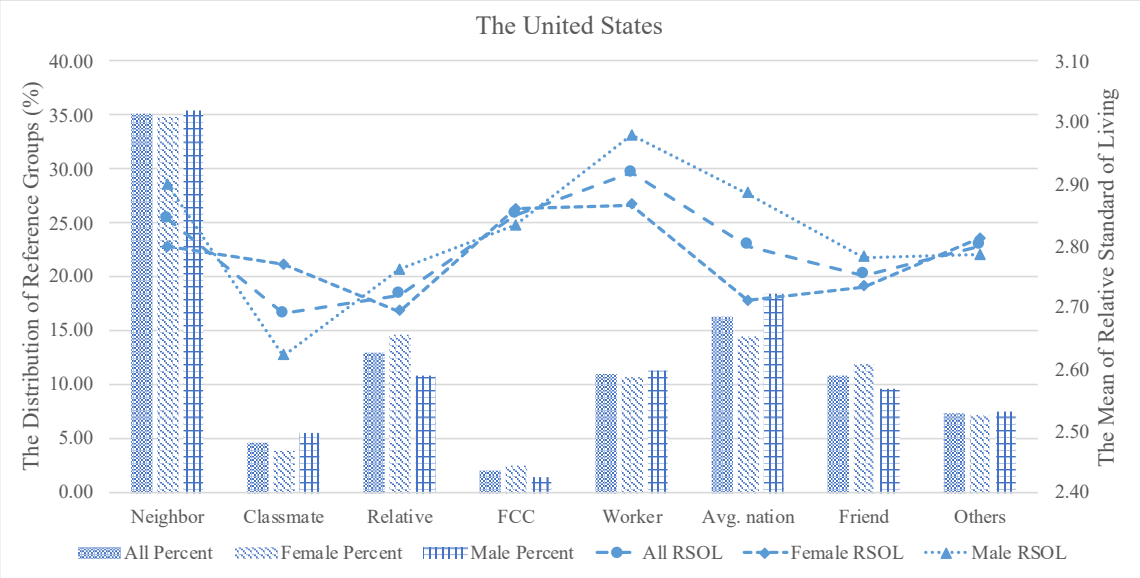
2.7. Appendices

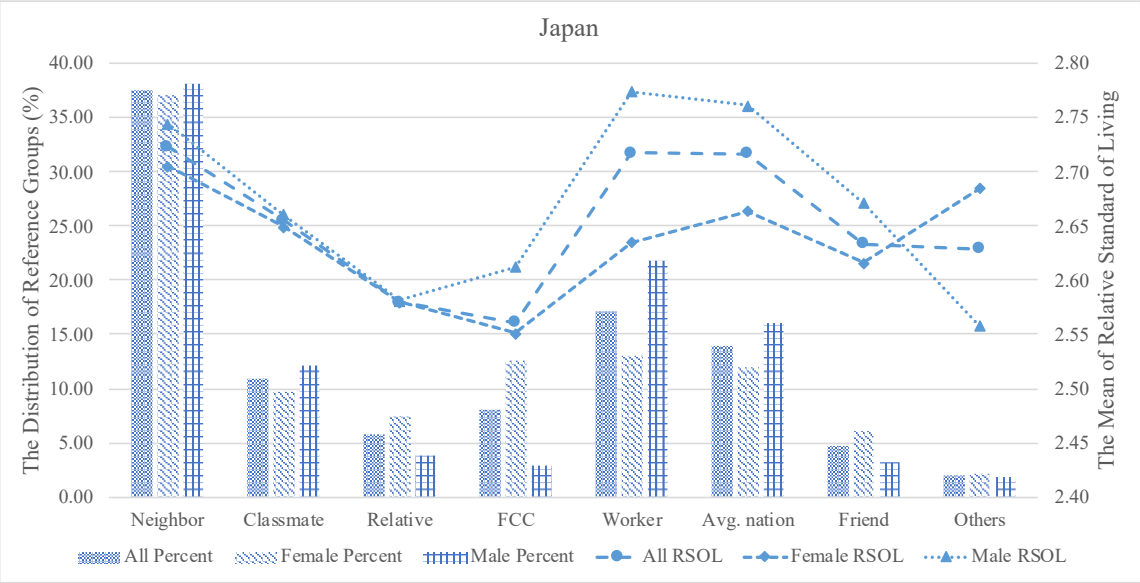
Appendix 2-1A Main Questions in the Survey

Q15. How does your standard of living compare with that of the people around you? (X ONE Box)	
1	Theirs is much lower than mine
2	Theirs is somewhat lower than mine
3	Theirs is about the same as mine
4	Theirs is somewhat higher than mine
5	Theirs is much higher than mine

In Q.15, with whom did you compare your standard of living? (X ONE Box)		Abbreviation	Categories in Table 2-1
1	Neighbor	Neighbor	Neighbor
2	Your own classmates when you were in school	Classmate	Classmate
3	Relatives	Relative	Relative
4	Families of your children's classmates	FCC	FCC
5	Worker in your company who is in your age group, has similar academic background, or who started working in the same year	WKR-SA	Worker
6	Worker in your company who is assigned to a similar job as yours, regardless of their age, academic background, year in which he or she joined the company.	WKR-SJ	Worker
7	Worker in another company in the same industry who belongs to the same age group, has similar academic background, or who started working in the same year	WKR-AA	Worker
8	Worker in another company in the same industry who is assigned to a similar job as yours, regardless of his or her age, academic background, and year in which he or she joined a company	WKR-AJ	Worker
9	Average person in Japan/in the US	Nation	Nation
10	Average person in the world	World	Others
11	Friend of acquaintance excluding above choices	Friend	Friend
12	Others (specify):	Others	Others
13	I don't know	I don't know	Others

Appendix 2-1B Corresponding Figures for Table 2-1





Appendix 2-1C The Distribution of Reference Groups from 2008 to 2012

	The Unites States									
	2008		2009		2010		2011		2012	
	Obs.	Percent	Obs.	Percent	Obs.	Percent	Obs.	Percent	Obs.	Percent
Neighbor	1,383	47.46	3,994	43.09	2,750	42.26	1,662	35.10	1,138	36.63
Classmate	99	3.40	334	3.60	219	3.37	219	4.63	102	3.28
Relative	219	7.52	758	8.18	637	9.79	611	12.90	394	12.68
FCC	64	2.20	177	1.91	84	1.29	94	1.99	53	1.71
WKR-SA	146	5.01	518	5.59	362	5.56	269	5.68	185	5.95
WKR-SJ	97	3.33	368	3.97	239	3.67	189	3.99	123	3.96
WKR-AA	26	0.89	142	1.53	54	0.83	35	0.74	30	0.97
WKR-AJ	27	0.93	67	0.72	33	0.51	26	0.55	15	0.48
Nation	513	17.60	1847	19.93	1206	18.53	771	16.28	517	16.64
World	56	1.92	135	1.46	98	1.51	82	1.73	44	1.42
Friend	261	8.96	776	8.37	489	7.51	514	10.86	299	9.62
Others	23	0.79	152	1.64	110	1.69	67	1.41	35	1.13
I don't know	0	0.00	0	0.00	226	3.47	196	4.14	172	5.54
Total	2,914	100.00	9,268	100.00	6,507	100.00	4,735	100.00	3,107	100.00

	Japan									
	2008		2009		2010		2011		2012	
	Obs.	Percent	Obs.	Percent	Obs.	Percent	Obs.	Percent	Obs.	Percent
Neighbor	1,313	48.72	2,672	43.79	2,151	40.50	1,828	37.53	1,851	40.61
Classmate	189	7.01	546	8.95	520	9.79	528	10.84	460	10.09
Relative	130	4.82	269	4.41	262	4.93	281	5.77	232	5.09
FCC	186	6.90	426	6.98	415	7.81	392	8.05	362	7.94
WKR-SA	123	4.56	303	4.97	319	6.01	258	5.30	266	5.84
WKR-SJ	209	7.76	477	7.82	421	7.93	446	9.16	376	8.25
WKR-AA	29	1.08	70	1.15	59	1.11	54	1.11	40	0.88
WKR-AJ	45	1.67	101	1.66	97	1.83	78	1.60	66	1.45
Nation	285	10.58	749	12.27	702	13.22	677	13.90	589	12.92
World	1	0.04	5	0.08	12	0.23	9	0.18	15	0.33
Friend	116	4.30	278	4.56	251	4.73	232	4.76	213	4.67
Others	17	0.63	43	0.70	27	0.51	25	0.51	25	0.55
I don't know	52	1.93	163	2.67	75	1.41	63	1.29	63	1.38
Total	2,695	100.00	6,102	100.00	5,311	100.00	4,871	100.00	4,558	100.00

Note: Excluding those who have no children but chose “Families of your children’s classmates,” and those who did not answer the previous question, “How does your standard of living compare with that of the people around you?”

Appendix 2-2A Blinder-Oaxaca Decomposition (Linear Probability Regression. Dependent Variable: Nation Dummy)

Dependent Variable:	Nation		
	US	Japan	Difference
	0.1616***	0.1377***	0.0239***
	(0.00)	(0.00)	(0.00)
Observation	4017	4329	
	US - Japan Comparison		
	Endowments	Coefficients	Interaction
Overall:	0.0073***	0.0261***	-0.0095***
	(0.00)	(0.00)	(0.00)
Details:			
FEMALE	-0.0005***	-0.0077***	-0.0002***
	(0.00)	(0.00)	(0.00)
HHINC	0.0000***	0.0136***	-0.0000***
	(0.00)	(0.00)	(0.00)
AGE35-59	-0.0023***	0.0059***	-0.0008***
	(0.00)	(0.00)	(0.00)
ABOVE60	-0.0001***	0.0102***	-0.0000***
	(0.00)	(0.00)	(0.00)
NOHIGH	0.0031***	0.0022***	-0.0012***
	(0.00)	(0.00)	(0.00)
HIGHSCH	0.0029***	0.0336***	-0.0036***
	(0.00)	(0.00)	(0.00)
MARRIED	0.0022***	0.0057***	-0.0015***
	(0.00)	(0.00)	(0.00)
OTHERMARSTA	0.0019***	-0.0017***	-0.0021***
	(0.00)	(0.00)	(0.00)
Constant		-0.0356***	
		(0.00)	
Observations	8346		

* p < 0.1, ** p < 0.05, *** p < 0.01.
Standard errors in parentheses are clustered by country.
Note: Independent variables of Blinder-Oaxaca decomposition are based on Table 2-3.

Dependent Variable:	Nation		
	Male	Female	Difference
	0.1694***	0.1314***	0.0381***
	(0.01)	(0.01)	(0.00)
Observation	3901	4445	
	Male - Female comparison		
	Endowments	Coefficients	Interaction
Overall:	-0.0048	0.0381***	0.0047
	(0.00)	(0.01)	(0.00)
Details:			
COUNTRY	-0.0004**	-0.0004	-0.0000
	(0.00)	(0.01)	(0.00)
HHINC	-0.0021	0.0353	0.0004
	(0.00)	(0.14)	(0.00)
AGE35-59	-0.0001	0.0091**	-0.0001
	(0.00)	(0.00)	(0.00)
ABOVE60	-0.0002	0.0140***	-0.0001
	(0.00)	(0.00)	(0.00)
NOHIGH	0.0001	-0.0054**	-0.0011***
	(0.00)	(0.00)	(0.00)
HIGHSCH	-0.0012	-0.0259***	0.0058
	(0.00)	(0.01)	(0.00)
MARRIED	-0.0001	-0.0067	-0.0003
	(0.00)	(0.02)	(0.00)
OTHERMARSTA	-0.0007	-0.0001	0.0001
	(0.00)	(0.00)	(0.00)
Constant		0.0183	
		(0.16)	
Observations	8346		

* p < 0.1, ** p < 0.05, *** p < 0.01.
Standard errors in parentheses are clustered by country.
Note: Independent variables of Blinder-Oaxaca decomposition are based on Table 2-3.

Appendix 2-2B Blinder-Oaxaca Decomposition (Linear Probability Regression. Dependent Variable: Neighbor Dummy)

Dependent Variable:	Neighbor		
	US	Japan	Difference
	0.3480***	0.3758***	-0.0278***
	(0.00)	(0.00)	(0.00)
Observation	4017	4329	
	US - Japan Comparison		
	Endowments	Coefficients	Interaction
Overall:	-0.0363***	-0.0041***	0.0125***
	(0.00)	(0.00)	(0.00)
Details:			
FEMALE	-0.0001***	-0.0013***	-0.0000***
	(0.00)	(0.00)	(0.00)
HHINC	-0.0000***	-0.2279***	0.0001***
	(0.00)	(0.00)	(0.00)
AGE35-59	-0.0110***	-0.0169***	0.0022***
	(0.00)	(0.00)	(0.00)
ABOVE60	-0.0006***	-0.0667***	0.0003***
	(0.00)	(0.00)	(0.00)
NOHIGH	-0.0055***	-0.0093***	0.0052***
	(0.00)	(0.00)	(0.00)
HIGHSCH	-0.0015***	-0.0258***	0.0028***
	(0.00)	(0.00)	(0.00)
MARRIED	-0.0227***	0.0027***	-0.0007***
	(0.00)	(0.00)	(0.00)
OTHERMARSTA	0.0052***	0.0021***	0.0027***
	(0.00)	(0.00)	(0.00)
Constant		0.3390***	
		(0.00)	
Observations	8346		

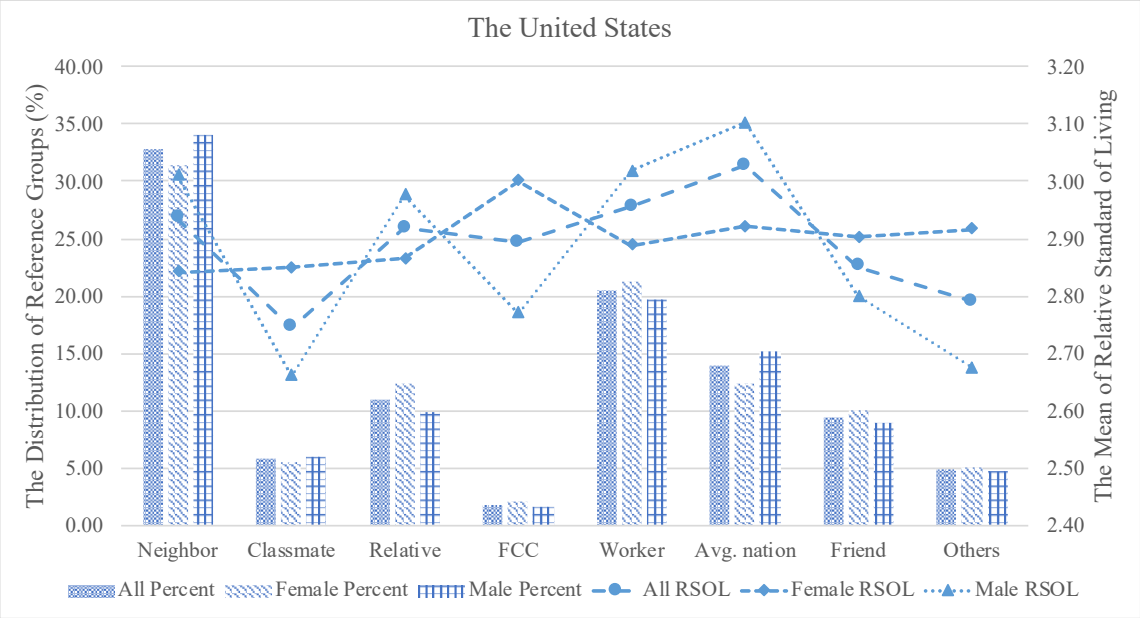
* p < 0.1, ** p < 0.05, *** p < 0.01.
Standard errors in parentheses are clustered by country.
Note: Independent variables of Blinder-Oaxaca decomposition are based on Table 2-3.

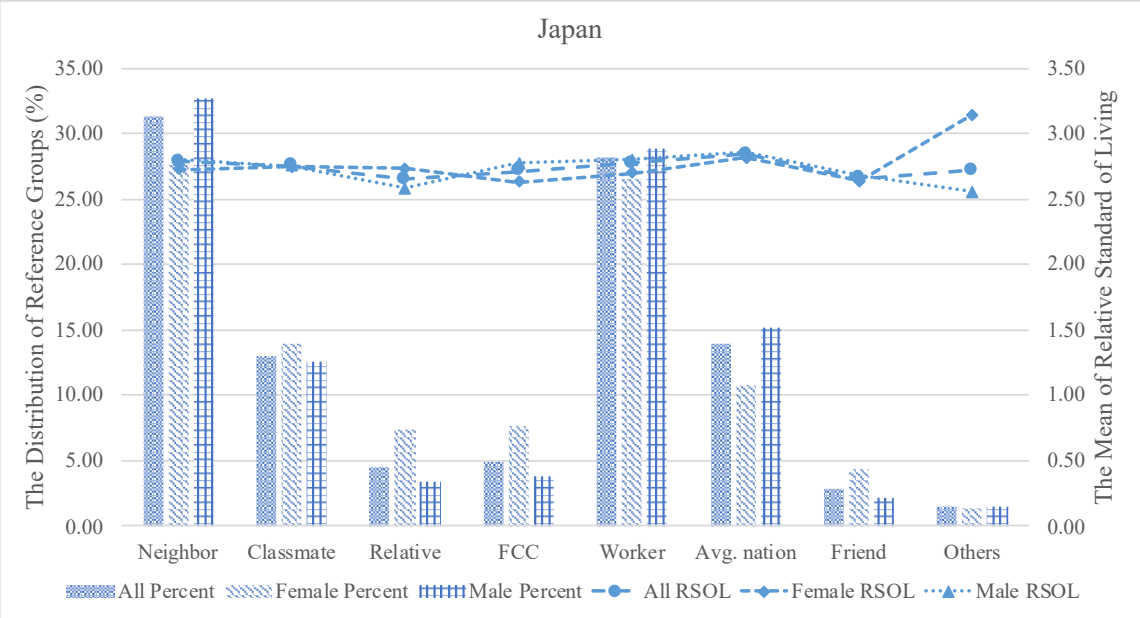
Dependent Variable:	Neighbor		
	Male	Female	Difference
	0.3648***	0.3604***	0.0044
	(0.02)	(0.01)	(0.01)
Observation	3901	4445	
	Male - Female comparison		
	Endowments	Coefficients	Interaction
Overall:	-0.0006	0.0100***	-0.0050
	(0.01)	(0.00)	(0.00)
Details:			
COUNTRY	-0.0000	-0.0011	-0.0000
	(0.00)	(0.00)	(0.00)
HHINC	-0.0001	-0.0120	-0.0001
	(0.00)	(0.24)	(0.00)
AGE35-59	-0.0002	0.0596**	-0.0004
	(0.00)	(0.03)	(0.00)
ABOVE60	-0.0006	0.0221	-0.0002
	(0.01)	(0.02)	(0.00)
NOHIGH	0.0015***	-0.0033	-0.0007
	(0.00)	(0.00)	(0.00)
HIGHSCH	0.0001	0.0085	-0.0019
	(0.00)	(0.01)	(0.00)
MARRIED	0.0041***	-0.0207	-0.0010
	(0.00)	(0.02)	(0.00)
OTHERMARSTA	-0.0053***	0.0013	-0.0007
	(0.00)	(0.01)	(0.00)
Constant		-0.0443	
		(0.21)	
Observations	8346		

* p < 0.1, ** p < 0.05, *** p < 0.01.
Standard errors in parentheses are clustered by country.
Note: Independent variables of Blinder-Oaxaca decomposition are based on Table 2-3.

Appendix 2-3 Corresponding Figures for Table 2-1 among Full-time Workers

Figures shows that among full-time workers, the reference group for 32.86% of Americans is neighbors, while for 20.41% it is workers. Similarly, the reference group for 31.33% of Japanese is neighbors, while for 28.22% it is workers. The differences are significant but smaller than the results presented in Appendix 2-1B.





Appendix 2-4 Summary Statistics for Table 2-6

Panel A		All		US		Japan	
Variable	Definition	Mean	S.D.	Mean	S.D.	Mean	S.D.
Neighbor	Reference Group Dummy: Neighbor	0.33	0.47	0.33	0.47	0.33	0.47
Worker	Reference Group Dummy: Worker	0.22	0.41	0.18	0.38	0.25	0.43
Nation	Reference Group Dummy: Average person in US/Japan	0.14	0.35	0.15	0.36	0.14	0.34
Others	Reference Group Dummy: Others	0.31	0.46	0.34	0.47	0.28	0.45
WORKCOMP	Working for a Company Dummy	0.97	0.17	0.97	0.16	0.97	0.18
SELF-EMPLOYED	Self-employed Dummy: 1=Self-employed or Employee of family business; 0=Employee of private company or nonprofit, Government employee, or Manager or private company or nonprofit	0.15	0.36	0.11	0.31	0.19	0.39
FULL-TIME	Employment Status Dummy: Full-time	0.59	0.49	0.61	0.49	0.58	0.49
PART-TIME	Employment Status Dummy: Part-time	0.27	0.44	0.32	0.47	0.22	0.42
OTHEREMPSTA	Employment Status Dummy: Others (Temporary work, Contract worker or others)	0.14	0.35	0.07	0.26	0.19	0.40
Observations		4,713		2,027		2,686	

Panel B		All		US		Japan	
Variable	Definition	Mean	S.D.	Mean	S.D.	Mean	S.D.
Neighbor	Reference Group Dummy: Neighbor	0.36	0.48	0.34	0.48	0.37	0.48
Worker	Reference Group Dummy: Worker	0.16	0.37	0.13	0.34	0.18	0.39
Nation	Reference Group Dummy: Average person in US/Japan	0.15	0.35	0.16	0.36	0.14	0.35
Others	Reference Group Dummy: Others	0.34	0.47	0.37	0.48	0.31	0.46
WORKCOMP	Working for a Company Dummy	0.72	0.45	0.74	0.44	0.71	0.45
HOMEMAKER	Homemaker Dummy: Housewife/Househusband	0.09	0.29	0.03	0.16	0.14	0.35
RETIRED	Retired Dummy	0.10	0.30	0.15	0.36	0.07	0.25
UNEMPLOYED	Unemployed Dummy	0.03	0.17	0.04	0.21	0.02	0.14
Observations		7,170		3,176		3,994	

Note: “Working for a Company Dummy” equals 1 if the respondent’s occupation is “Office and administrative support,” “Sales and related occupations,” “Managerial occupations,” “Specialist/Technical Experts,” “Service occupations,” or “Industrial occupations”; equals 0 if the occupation is “Farming, fishing, and forestry,” “Housewife/Househusband,” “Student,” “Retired,” “Unemployed” or “Others”.

Appendix 2-5 Summary Statistics for Table 2-7

		US		Japan	
Variable	Definition	Mean	S.D.	Mean	S.D.
RSOL=1	Theirs is much higher than mine	0.07	0.26	0.05	0.22
RSOL=2	Theirs is somewhat higher than mine	0.23	0.42	0.32	0.47
RSOL=3	Theirs is about the same as mine	0.53	0.50	0.52	0.50
RSOL=4	Theirs is somewhat lower than mine	0.15	0.36	0.11	0.31
RSOL=5	Theirs is much lower than mine	0.02	0.14	0.00	0.06
FEMALE	Female Dummy	0.51	0.50	0.52	0.50
HHINC	Approximately how much was the annual earned income before taxes and with bonuses included of your entire household for 2010?	10.81	0.95	10.77	0.67
WORKCOMP	Working for a Company Dummy	0.74	0.44	0.71	0.45
HOMEMAKER	Homemaker Dummy: Housewife/Househusband	0.03	0.16	0.14	0.35
RETIRED	Retired Dummy	0.15	0.36	0.07	0.25
UNEMPLOYED	Unemployed Dummy	0.04	0.21	0.02	0.14
UNDER35	Age Group Dummy: Under 35 years old	0.17	0.38	0.10	0.30
AGE35-59	Age Group Dummy: Aged 35 to 59	0.51	0.50	0.59	0.49
ABOVE60	Age Group Dummy: Above 60 years old	0.32	0.47	0.31	0.46
NOHIGH	Education Dummy: Did not finish high school	0.03	0.18	0.09	0.28
HIGHSCH	Education Dummy: Graduate from high school but not graduate from college	0.56	0.50	0.65	0.48
COLLEGE	Education Dummy: Graduate from college or higher	0.40	0.49	0.26	0.44
MARRIED	Marital Status Dummy: Have a spouse (husband or wife, including common-law marriage)	0.59	0.49	0.81	0.39
SINGLE	Marital Status Dummy: Have never married	0.23	0.42	0.11	0.32
OTHERMARSTA	Marital Status Dummy: Others (currently unattached, having divorced or separated, or an unattached widow or widower)	0.18	0.38	0.08	0.26
Neighbor	Reference Group Dummy: Neighbor	0.34	0.48	0.37	0.48
Classmate	Reference Group Dummy: Classmate	0.05	0.22	0.11	0.31
Relative	Reference Group Dummy: Relative	0.13	0.33	0.05	0.23
FCC	Reference Group Dummy: Families of your children's classmates	0.02	0.14	0.09	0.28
Worker	Reference Group Dummy: Worker	0.13	0.34	0.18	0.39
Nation	Reference Group Dummy: Average person in US/Japan	0.16	0.36	0.14	0.35
Friend	Reference Group Dummy: Friend	0.11	0.31	0.04	0.20
Others	Reference Group Dummy: Others	0.06	0.23	0.02	0.12
Observations		3,176		3,994	

Chapter 3.
Bequest Motives in the United States and Japan

Abstract

This study investigates altruistic attitudes in terms of bequest motives and identifies the factors that cause differences in the altruistic bequest motives between American and Japanese parents. The evidence from the inter-country differences in bequest motives reveals that there is a significant difference between the two countries when controlling for several socio-economic variables. Applying the Blinder–Oaxaca decomposition shows that the raw difference between American and Japanese individuals in terms of being altruistic is 0.3268, and 99.30% of the difference is explained by differences in the coefficients. The gaps in the coefficients of the variables *Female dummy* and *Number of children* expand the difference in the *Altruism* between these two countries. Given these results and differences in the financial saving motives between the two countries, there are two possible reasons why the Japanese are more self-interested in terms of bequest motives: 1) Japanese parents are more apprehensive and 2) they are more likely to implement intergenerational transfers in the form of human capital investments and *inter vivos* transfers. The results carry implications for designing appropriate tax policies, addressing mismatched nursing care needs, and promoting gender equality. The findings from Japan, in particular, may be extended to other Asian countries with declining fertility rates.

Keywords: Altruism; Self-interest; Bequest Motives; Intergenerational Transfer; Saving Motives; Country Difference

JEL classification: D12, D64, P52

3.1. Introduction

Studies on intergenerational transfer have multiplied over the years. Economists and policymakers are interested in when and how wealth is passed down within the family community. Dunn and Phillips (1997) find that *post-mortem* bequests are more often divided among all children, while *inter vivos* transfers are more likely to be distributed to poor children. Lundholm and Ohlsson (2000) study an altruistic model that assumes both that there is private information in *inter vivos* transfers and that reputations are considered in bequest behaviors, and they conclude that parents' optimal choice is compensatory gifts (to equalize consumption opportunities among children) and equal bequests (to assure no deterioration in parents' *post-mortem* reputations). Nordblom and Ohlsson (2011) examine the relationship between human capital transfers (e.g., education) and property transfers (e.g., *inter vivos* gifts and bequests), showing that the incidences of transfers are positively correlated.

Previous studies have analyzed the motivation behind one's decision to leave an inheritance. In the standard altruism model proposed by Becker (1974) and Barro (1974), the utility of other family members (e.g., heir[s]) directly enters the individual's utility function because the intergenerational transfer behavior could increase the heir(s)' utility. The manipulative bequest motive model proposed by (Bernheim et al., 1985) posits that parents intentionally use bequest-leaving strategies to manipulate the behavior of the beneficiaries. Concerning lifetime uncertainty (Davies, 1981; Yaari, 1965), Abel (1985) presents a life-cycle model of precautionary savings and accidental bequests in which individuals save to avoid low consumption levels during old age and thus pass on the remaining wealth to their heirs as accidental bequests when they die.

Under different household behavior models, individuals have divergent motives for leaving an inheritance to their descendants. Horioka et al. (2000) and Horioka (2002, 2014) summarize three household behavior models, namely, the life cycle model, the altruism model, and the dynasty model. In the life cycle model (also referred to as the self-interest model), individuals usually have no plan to leave an inheritance, or they use the bequest in exchange for financial assistance

or nursing care provided by their children during their old age. In other words, bequeathing assets to children is merely a form of payment for services during old age or is simply an accidental transfer of leftover money. In the altruism model, individuals leave a bequest that was motivated by the interests of their children. In the dynasty model, individuals are inspired to keep the family name alive, implying that they would leave an inheritance for the children who would carry on the family lineage or family business.

Several studies have focused on which model is the most prevalent in the real world. Empirical studies such as Gale and Scholz (1994) find that intended transfers and bequests account for 51% of net-worth accumulation, implying that several important components might be excluded in the life-cycle model. Horioka (2014) concludes that Americans and Indians are more altruistic than the Japanese and Chinese, and that income levels, income growth, and inheritance laws could explain either none or only a small part of these inter-country differences. Niimi and Horioka (2019) use the same survey and limit the sample to respondents aged 60-years-old or above who are retired along with their spouse to explain the effect of precautionary savings and bequest motives on the lower wealth decumulation rate in Japan. They similarly find that elderly retired Japanese people have a less strong (altruistic) bequest motive. Niimi and Horioka (2018) find that Japanese women have fewer intentions to leave a bequest to their children compared to Japanese men, but there is no significant gender difference in the United States (US). (Horioka et al., 2018) provide evidence of strategic bequest motives in Japan, showing that the respondents are more likely to provide care for their parents when they expect to receive an inheritance from them. In terms of the value of the bequests that individuals have received from their parents or the value of their savings plans motivated by bequests, the empirical results show that there is fairly insubstantial bequeathing in Japan while the average net savings for bequest motives in the US is relatively high (Horioka, 2009; Horioka et al., 2000; Horioka and Watanabe, 1997) These empirical studies all imply that the life-cycle model is more prevalent in Japan than in the US, while Americans are more altruistic than the Japanese in *post-mortem* intergenerational transfers.

This study is motivated by these intriguing results in Japan and the US, especially as income levels and growth cannot provide a satisfactory explanation.[13] To understand why Americans have more altruistic attitudes in *post-mortem* intergenerational transfers than the Japanese, this study aims to identify the determinants of altruistic bequest motives within the family community for both American and Japanese parents by re-examining Horioka (2014)'s results and conjectures. To this end, I first analyze which (and how) socio-economic variables such as gender, age, and household income affect bequest motives in the two countries. Then, I use the Blinder-Oaxaca decomposition method to examine the extent to which endowment differences and the coefficients of these variables contribute to inter-country differences.

This empirical research uses the survey data collected for the Preference Parameters Study of Osaka University. I apply both linear probability regression and probit regression models in this study, and the scope only includes Japanese and American parents who are married and have at least one child in the family. The evidence shows that there is a significant difference in bequest motivations between these two countries, even after controlling for several socio-economic variables. The Blinder–Oaxaca decomposition shows that more than 99.30% of the difference is explained by the difference in the difference in the *coefficient effect* instead of the *endowment effect*. The *female* and *number of children* coefficient effects expand the gap in *Altruism* between the US and Japan.

The results from this study provide implications in terms of designing appropriate tax policies, addressing mismatched nursing care needs, and promoting gender equality. In addition, the results on bequest and saving motives from Japan may be extended to other Asian countries facing declining fertility rates.

[13] Horioka (2014) compares the bequest motives in China, India, Japan, and the US. This study only focuses on the US and Japan, which have lower annual GDP per capita growth rates than China and India. The annual GDP per capita growth in 2011 was 0.07%, 0.85%, 5.25%, and 9.01% for Japan, the US, India, and China, respectively (retrieved on February 2, 2018 from WDI Database Archives [beta]).

The paper is organized as follows. Section 3.2 describes the data used to derive the empirical results. The inter-country analysis of bequest motives is described in Section 3.3, followed by an account of possible explanations in Section 3.4. Section 3.5 discusses the results and concludes the study.

3.2. The Survey and Household Behavior

Osaka University's Preference Parameters Study (PPS) is used in this study. This panel survey employs two-stage stratified sampling and has been conducted in Japan since 2003. The PPS includes men and women aged 20 to 69-years-old. The sample source was collected from the Basic Resident Register (*Jumin Kihon Daicho*). Osaka University has conducted the survey in the US since 2005 by employing random sampling based on age, gender, and race-ethnicity and sampling men and women aged 18 to 99-years-old from all states except Alaska and Hawaii. The sample source was collected from the "TNS MySurvey Panel."

From 2009 until 2012, this annual survey contained the following question about respondents' bequest intentions: "How do you feel about leaving an inheritance to your children?" The respondents could select only one of the following eight bequest motives: "1. I plan to leave an inheritance to my child(ren) no matter what" (hereafter "leave an inheritance no matter what"), "2. I plan to leave an inheritance to my child(ren) only if they provide care (including nursing care) during old age" (hereafter "leave an inheritance if children provide care"), "3. I plan to leave an inheritance to my child(ren) only if they provide financial assistance during old age" (hereafter "leave an inheritance if children provide assistance"), "4. I plan to leave an inheritance to my child(ren) only if they carry on the family business" (hereafter "leave an inheritance to the one carrying on the family business"), "5. I do not plan to make special efforts to leave an inheritance to my child(ren) but will leave whatever is left over" (hereafter "leave whatever is left over"), "6. I do not plan to leave an inheritance to my child(ren) under any circumstances because doing so

may reduce their will to work" (hereafter "tough love"[14]), "7. I do not plan to leave an inheritance to my child(ren) under any circumstances because I want to use my wealth myself" (hereafter "use my wealth myself"), and "8. I want to leave an inheritance to my child(ren) but I won't because I don't have the financial capacity to do so" (hereafter "no capacity to do so"). The question and the answer choices are identical in the US and Japanese surveys.

To discuss the framework for the regression, the determinants in the household behavior models, and to obtain a good understanding of Horioka's (2014) results, this study uses the 2012 wave data for the US and Japan surveys and implements an identical classification scheme as in Horioka (2014): those who would definitely "leave an inheritance no matter what" are regarded as having an unconditional altruistic bequest motive. Similarly, those who report "tough love" are considered to have altruistic bequest motives. Those who leave an inheritance in exchange for nursing home care and financial assistance are considered to have conditional bequest motives. In addition, those who intend to "use my wealth myself" and those who are going to "leave whatever is left over" belong to the conditional bequest motives category, but they are considered as engaging in self-interested household behavior. Those who would "leave an inheritance to the one carrying on the family business" are aligned with the dynasty-building bequest motive, while those who have a positive will to leave an inheritance but have no capacity to do so are classified in the "other" category.

For the 2012 wave, there are 3,653 and 4,588 observations in the US and Japan, respectively. 3,467 (4,514) of the American (Japanese) respondents answered the question concerning bequest motives. The observations answered by unintended household members were excluded in the US sample, leaving 3,087 observations. Regarding the "unmatched respondents" problem in the US survey noticed by the Institute of Social and Economic Research at Osaka University, respondents with identical genders and birth years from 2009 till 2012 are included in the analysis. Otherwise,

[14] This implies that parents decided to leave no bequest to their children in order to increase their discount factor, which is consistent with the tough love altruism model proposed by Bhatt and Ogaki (2012).

they are all treated as unmatched respondents and eliminated from the study. This rule is applied to the Japanese sample as well.[15] As this study focuses on bequest motives toward children, the study requires the respondents to have at least one child in the family. Those who do not have children are excluded from the analysis. The sample was limited to those who are married (those who reported that "I have a spouse [husband or wife, including common-law marriage]" in the survey.) Overall, we are left with 1,508 and 3,369 observations in the sample for the US and Japan, respectively.

Furthermore, this study assumes that the respondents will not die intestate and that the PPS survey truthfully reflects their bequest motives and attitudes. As an analysis of bequest division plans requires at least two children in the family, thus possibly causing endogeneity issues, and given that the mechanism behind the division plan does not simply consist of either the self-interest model or altruism model (Horioka, 2014), I restrict the analysis to bequest motives in this paper.

3.3. Empirical Results on Bequest Motives

This section describes the empirical analysis of bequest motives in the US and Japan by illustrating the types of bequest motives that American and Japanese parents have. This section also describes the linear probability and probit regression models that were used to identify the determinants of the bequest motives, and it explains the Blinder-Oaxaca decomposition that was used to decompose the difference.

3.3.1. Country and Gender Differences in Bequest Motives

This subsection presents American and Japanese parents' bequest motives as well as the country and gender differences.

[15] For detailed information on the "unmatched respondents" problem in the US, please refer to "Disclaimers for Using Datasets from the Preference Parameters Study in the US by Osaka University." from http://www.iser.osaka-u.ac.jp/survey_data/top_eng.html, retrieved on September 18, 2018.

Table 3-1 shows the proportion weighted by sampling weights of each bequest motive choice among American and Japanese parents. In the US, the most cited bequest motive is "leave an inheritance no matter what," followed by "leave whatever is left over." In contrast, the most cited bequest motive in Japan is "leave whatever is left over," followed by "leave an inheritance no matter what." More Japanese men choose to "leave an inheritance no matter what," while more Japanese women choose to "leave whatever is left over," and the differences in gender for those two bequest motives are significant at the 1% and 5% levels, respectively. However, the analogous gender-based differences are insignificant in the US.

Table 3-1 Here

For the US sample, 59.02% of Americans have an altruistic bequest motive and 30.08% have a self-interested one. On the contrary, 30.06% of the Japanese have an altruistic bequest motive while 51.27% have a self-interested one. In addition, 53.49% of Japanese women are found to have self-interested bequest motives and fewer of them are altruistic compared to Japanese men. The gender differences in altruistic and self-interested bequest motives are significant at the 1% and 5% levels for Japan, but they are insignificant for the US.[16]

The third most cited bequest motive is "no capacity to do so" in both the US and Japan. Especially for women, both American and Japanese women are more likely than men to state that they have no capacity to leave an inheritance to the next generation. The gender differences are insignificant in the US but significant in Japan at the 1% level.

[16] The survey contains the statement, "I want to bequeath as much of my inheritance as possible to my spouse," and the response scale ranges from 1 - "Particularly true for me" to 5 - "Doesn't hold true at all for me." In the 2012 wave, among those who are married and have at least one child in the family (i.e., the same sample selection requirement as in Table 3-1), 27.45% of Japanese parents chose option 1 or 2, while 29.70% chose option 4 or 5. On the contrary, 54.60% of Americans chose option 1 or 2 and 21.67% chose option 4 or 5. For those who are married and have at least one child in the family and do not intend to make a special effort to leave an inheritance to their children, 19.62% of Japanese parents agree or strongly agree with the statement, while 35.59% disagree or strongly disagree. In contrast, 47.57% of Americans agree or strongly agree and 25.48% disagree or strongly disagree with the statement. Therefore, leaving as much of the inheritance to their spouse as possible is not the reason more Japanese parents do not intend to make a special effort to leave an inheritance to their children in comparison with their American counterparts.

Less than 1% of American and Japanese parents intend to leave their inheritance to the child who will carry on the family business, suggesting that the dynasty-building motive is not prevalent in either the US or Japan. Nonetheless, significantly more Japanese parents choose "leave an inheritance if carry on the family business' than do American parents."[17]

The results suggest that an altruistic bequest motive is more prevalent than a self-interested one in the US and that there is no significant gender difference in the US. However, Japanese parents are more likely to have self-interested bequest motives rather than altruistic ones, especially Japanese mothers.

3.3.2. Determinants of Altruistic and Self-interested Bequest Motives

Given that the most cited bequest motives are altruistic and self-interested ones, this section analyzes the factors that led parents to develop these two motives. As a robustness check, Appendix 3-1 provides the intra-country determinants of bequest motives, including altruistic, self-interested, dynasty-building, and other motives.

To understand the factors affecting the choice between altruistic and self-interested bequest motives, it is assumed that the model that determines altruism/self-interest depends on an individual's socio-economic characteristics:

$$Altruism_i = \alpha + \beta Country_i + \gamma' \boldsymbol{X_i} + \delta' \boldsymbol{X_i} Country_i + \varepsilon_i \quad (3\text{-}1)$$

where the dummy variable $Altruism_i$ equals 1 if the individual i has an altruistic bequest motive, otherwise equals 0 in the case of self-interest; $Country_i$ represents where individual i lives; $\boldsymbol{X_i}$ is a vector of socio-economic characteristics, such as life expectancy (LIFEEXP) and its square, the log of household income in 2011 (HHINC), and dummies for gender (FEMALE),

[17] Moriguchi (2010) and Mehrotra et al. (2013) disclose that adult adoption is more common and predominant in Japan. The unrelated child adoption per 1,000 births in Japan is much lower than that in the US, and approximately 98% adoptions in Japan consist of adult adoptions. Mehrotra et al. (2013) suggest that succession planning is what motivates adult adoptions.

age 65 or above (AGE65), strength of faith (FAITH), number of children (CHILDNUM), and educational attainment (NOHIGH, HIGHSCH, and COLLEGE).[18]

The reason why this study uses life expectancy rather than respondent age is because women live longer than men in general. The normal retirement ages are 65 years and 63 years for American men and women, and 65 years for both Japanese men and women. The average effective ages of retirement for men (women) were 65.0 (65.1) years and 69.1 (66.6) years for the US and Japan, respectively, from 2007 until 2012.[19] The life expectancy at those ages was 17.9 (20.5) and 15.8 (22.1) years in 2012.[20] As a result, the length of retirement for women is longer than for men. In addition, in regard to lifetime uncertainty (Davies, 1981; Yaari, 1965), the expectation of years to live enters the utility function, and so it is convenient to use life expectancy at each age in the analysis. The life expectancy data at each age are retrieved from the National Centre for Health Statistics in the US and the Ministry of Health, Labour, and Welfare in Japan.

Due to missing information about educational attainments in the 2012 wave, the last observations were carried forward to fill in the remainder of the sample. Assuming constant educational attainments since the last update, the values from the 2011 wave are used if available. Otherwise, the values from 2010 or 2009 are used. Those respondents without children are excluded, and the sample is limited to those who are married. Table 3-2 presents the summary statistics for the dependent and independent variables. The results indicate that 66.13% of Americans and 33.45% of Japanese parents have altruistic bequest motives, and that 51.6% and 50.8% of the respondents are female in the US and Japan, respectively. The average ages of those

[18] Annual household income in 2011 was reported in 12 categories. I use the mid-point of each income category and assign a value of half of the upper bound for the lowest category (5,000 USD and 500,000 JPY) and 1.5 times of the lower bound for the highest category (300,000 USD and 30,000,000 JPY). The value in JPY is converted into USD by using 2011 purchasing power parities (PPP) from the OECD (2019), which was retrieved on March 26, 2019 (1 USD= 107.454281 JPY). The household income in 2011 is taken as a natural logarithm in the analysis. The results are robust when using 2011 yearly average exchange rates of TTM from the Mitsubishi UFJ Financial Group (1 USD=79.80 JPY).

[19] The normal retirement age is the age at which an individual could retire in 2014 without any reduction to their pension, provided that they had a full career since age 20. The data were downloaded from the OECD's "Ageing and Employment Policies - Statistics on average effective age of retirement" from http://www.oecd.org/els/emp/average-effective-age-of-retirement.htm, retrieved on September 19, 2018.

[20] The US life expectancy data were obtained from the National Center for Health Statistics, which was retrieved on September 13, 2018. The Japanese data were obtained from the Ministry of Health, Labour, and Welfare, which was retrieved on September 13, 2018.

who have at least one child are 56.99 and 55.33 years in the US and Japan, respectively. The corresponding life expectancies are 26.40 years and 30.23 years.

Table 3-2 Here

Table 3-3 presents the results from a linear probability regression (LPR) (column 1) and a probit regression (column 2), along with the margins at the mean (column 3). Table 3-3 shows that the Japanese are significantly less altruistic than Americans when all the other variables are controlled for. On average, being Japanese decreases the probability of having an altruistic bequest motive by 0.2994 ($p<0.01$), while being female decreases the probability of having an altruistic bequest motive by 0.1015 ($p<0.01$). The gender discrepancy comes mainly from Japan. Figure 3-1 shows the gender difference of adjusted predictions with 95% confidence intervals in the US and Japan. In Japan, being a woman significantly decreases the probability of an altruistic bequest motive by 0.1500 ($p<0.01$), while this effect is insignificant in the US. Additionally, Americans aged 65 years and above are less altruistic, while rich and pious Japanese parents are more altruistic. The more children the Japanese have, the less altruistic they appear to be.

Table 3-3 Here

Figure 3-1 Here

Figure 3-2 presents the effect of LIFEEXP on *Altruism*. The probability of being altruistic with respect to an increase in LIFEEXP is U-shaped in the US. The probability of being altruistic in the US increases when LIFEEXP decreases from 33.28 in the LPR regression (33.16 in the probit regression), whereas this probability monotonically increases in Japan.

Figure 3-2 Here

3.3.3. Differences between the US and Japan

This subsection aims to explain the difference in altruistic bequest motives between American and Japanese parents. The Blinder–Oaxaca decomposition, a seminal approach following Blinder

(1973) and Oaxaca (1973), is used to decompose the difference in altruistic motives into three components: endowments, coefficients, and interaction.

To obtain a detailed decomposition, and because the results presented in Table 3-3 are very similar between the LPR and probit regressions, I use the Blinder–Oaxaca decomposition based on the LPR in this subsection.[21]

The raw difference between the US and Japan in *Altruism* is equal to:

$$\Delta Altruism = E(X_{US})'\beta_{US} - E(X_{JP})'\beta_{JP} \tag{3-2}$$

where X is the vector of socio-economic characteristics in equation (3-1) and β is the vector of coefficients. The group difference (equation (3-2)) may be decomposed as:

$$\begin{aligned} \Delta Altruism \quad = \quad & \{E(X_{US}) - E(X_{JP})\}'\beta_{JP} \\ & + E(X_{JP})'(\beta_{US} - \beta_{JP}) \\ & + \{E(X_{US}) - E(X_{JP})\}'(\beta_{US} - \beta_{JP}) \end{aligned} \tag{3-3}$$

The first component of equation (3-3),

$$\{E(X_{US}) - E(X_{JP})\}'\beta_{JP},$$

represents the "endowment effect," measuring the expected change in Japan's mean outcome if the Japanese had Americans' characteristics. The second component,

$$E(X_{JP})'(\beta_{US} - \beta_{JP}),$$

represents the "coefficient effect," measuring the expected change in Japan's mean outcome if the Japanese had the coefficients of the American sample. The third component,

$$\{E(X_{US}) - E(X_{JP})\}'(\beta_{US} - \beta_{JP}),$$

represents the "interaction effect," measuring simultaneous effect from endowment and coefficients between the US and Japan.

Table 3-4 presents the results of Blinder–Oaxaca decomposition based on LPR. The mean outcomes for the US and Japan are 0.6613 and 0.3345, respectively, with the raw difference being 0.3268. The endowment effect for FAITH enlarges the gap between the countries, while the

[21] The empirical analysis was conducted in Stata and followed the same procedures as the ones used in Jann (2008).

CHILDNUM effect reduces the gap. The overall endowment effect is not significant. A large part of the difference in the likelihood of having an altruistic bequest motive between American and Japanese parents comes from the differences in coefficients rather than from differences in endowments, and the coefficient effect explains 99.30% of the raw difference. The FEMALE and CHILDNUM coefficient effects enlarge the gap, while the AGE65, HHINC, and FAITH coefficient effects reduce the gap. The total coefficient effects of LIFEEXP and its quadratic term reduce the gap, which is confirmed in Figure 3-2.

In total, the endowment effect of FAITH and the coefficient effects of FEMALE and CHILDNUM expand the gap in *Altruism* between the US and Japan, while the endowment effect of CHILDNUM and the coefficient effects of the total effects of LIFEEXP and its square, AGE65, HHINC, and FAITH shrink the gap. Here, FEMALE and CHILDNUM do not significantly increase or decrease the variable *Altruism* in the American sample, but they do significantly decrease Japanese *Altruism*.

Table 3-4 Here

3.4. Possible Explanations of Different Bequest Motives

This section provides a potential explanation of the country and gender differences that were illustrated in the previous section.

Niimi and Horioka (2018) mention that the inheritance tax is higher in Japan than it is in the US. This is a potential explanation for why American parents are more likely to be altruistic than Japanese parents in the bequest context. However, this would hardly explain why women are less altruistic in bequest motives than men in Japan, as taxes apply to every Japanese citizen. Nevertheless, as higher taxes could preclude Japanese parents from *post-mortem* intergenerational transfer, Japanese parents may opt to increase human capital investments or *inter vivos* transfers.

Another possible explanation is that the Japanese are more financially anxious and apprehensive about their economic futures. Recalling the results displayed in Table 3-1, there is

no significant difference in "leave inheritance if children provide assistance" and "use my wealth myself" between Japanese and American parents. The predominant difference is that more Japanese parents state a preference to "leave whatever is left over" than American parents. In the Japanese sample, compared to Japanese men, more Japanese women decide to "leave whatever is left over" rather than either use the inheritance in exchange for financial assistance and/or care, or have no bequest motive at all toward child(ren). Hence, their bequest motives cannot be regarded as purely self-interested. Besides, considering the aging situation in Japan, it may be argued that the Japanese are more concerned about the future and are therefore more likely to save for precautionary motives and/or old age and nursing home expenses.[22] Given the uncertainty in terms of life expectancy, the leftover will be transferred to the next generation.

In addition, it is perplexing to find a discrepancy in *Altruism* between Japanese women and men (Table 3-1 and Table 3-3). Prior literature finds that women donate more to charitable causes (Leslie et al., 2013; Mesch et al., 2011; Simmons and Emanuele, 2007; Willer et al., 2015). Duflo (2003) finds that the old-age pension received by women has a significant effect on girl height in South Africa, but the pension received by men does not. Mesch et al. (2011) shows that women have a higher level of empathic concern and principle of care than men, with charitable giving behaviors being positively and significantly associated with these two factors. Willer et al. (2015) explain the gender gap by means of empathy levels. Andreoni and Vesterlund (2001) suggest that altruism in women is positively related to the relative price of giving, which means that when altruism is expensive, women become more altruistic while men will be kinder when the relative price is lower. These studies all indicate that women are more or conditionally more altruistic than men. It is therefore puzzling that Japanese women are more self-interested than Japanese men.

[22] For example, the 2025 Problem ("2025 *nen monadi*" in Japanese) refers to the first baby boom generation—also called "*dankai no sedai*" in Japanese—who will turn 75 years old or older by that date, and the consequent concerns regarding the surge in expenditure relating to nursing home care, medical expenses, and so on. For more information, please refer to https://www.mhlw.go.jp/shingi/2006/09/dl/s0927-8e.pdf (in Japanese), retrieved on December 27, 2018.

Given that American parents are more likely to leave an inheritance no matter what, I would speculate that they save for such intergenerational transfers to their children. Since Japanese parents, especially Japanese women, are more likely to leave whatever is left over, an analysis of saving motivations will, therefore, contribute to an understanding of where the "left-over" comes from. Also, it will help researchers to better understand whether Japanese parents are purely self-interested in regard to intergenerational transfers. If Japanese parents are purely self-interested, they will not save for human capital investments, for *inter vivos* transfers, or for bequest motives. If Japanese parents are more concerned than American parents, they will save more for precautionary motives.

3.4.1. Data for Saving Motives

For the 2013 wave, PPS asked, "Does your household currently have any bank deposits, financial assets, or other savings for the following motives?" The respondents answered "Yes" or "No" for the question "Do you currently have any savings for this motive?" There are 13 saving motives listed below: "1. For illness, natural disasters, and other unexpected expenditures" (hereafter the "illness and disasters" motive), "2. For one's children's educational expenses" (hereafter the "children's education" motive), "3. For one's own marriage expenses" (hereafter the "marriage" motive), "4. For one's children's marriage expenses" (hereafter the "children's marriage" motive), "5. For the purchase, construction, or renovation of one's own home (including land)" (hereafter the "housing" motive), "6. For living expenses during old age" (hereafter the "old age expenses" motive), "7. For nursing and other expenses when one requires long-term care" (hereafter the "nursing care" motive), "8. For the purchase of consumer durables such as cars, furniture, electrical appliances, etc." (hereafter the "consumer durables" motive), "9. For leisure such as travel, sports, etc." (hereafter the "leisure" motive), "10. In order to leave a gift or bequest to my children" (hereafter the "bequest" motive), "11. For a motive or motives not listed above" (hereafter the "other" motive), "12. I have no specific saving motives but for peace

of mind" (hereafter the "peace of mind" motive), "13. I currently have no savings" (hereafter the "no savings" motive).

There is a difference in the Japanese and American surveys regarding these saving motive questions. The Japanese survey asks about the household's saving motives, while the American survey asks about the respondent's personal saving motives.[23] Since bequest motives are concerned with a respondent's personal intention, the saving motives should also reflect personal intentions. Here, I use a question in the 2011 wave to identify who made the household's decision on savings and investments.[24]

For the 2013 wave, there are 5,079 and 4,341 observations in the US and Japan, respectively. To account for "unmatched respondents" and other unintended problems, this section only includes the respondents that have identical genders and birth years from 2009 to 2013. In addition, the sample excludes respondents with changes in the number of children and marital status, and it excludes those who had "no savings," those or had a missing response to any of the other 12 motives in 2013, and those who did not answer the bequest motive question in 2012. To address the household saving motives in the Japanese survey, this section only includes those who chose "You decide" for the "Decision on savings and expenditures" question in the 2011 wave. This results in this study include 262 and 610 observations for the US and Japan, respectively. Because the number of remaining observations used in this section is relatively low, the following section suggests an explanation in regard to why Japanese parents are more self-interested than their American counterparts.

[23] Here, the English translated version of the Japanese survey is unlike the original Japanese survey in that it uses "my" and "I" for each saving motive, but "*anata-no-setai*" refers to the household in the question in the original Japanese survey. The American survey uses "my" and "I."

[24] The question in the 2011 wave asks, "Please answer this question if you have a spouse: Who mainly decides on expenditures, savings, and investments for your household? (X ONE Box For EACH Row)." For the "Decision on savings and investments" sub-question, the respondents can only choose one response among these options: "You decide," "Your spouse decides," "Discuss together but you mainly decide," and "Discuss together but your spouse mainly decides."

3.4.2. Country and Gender Differences in Saving Motives

Table 3-5 provides the mean and the difference for each saving motive in the US and Japan. Among precautionary saving motives, more Japanese parents save for "illness and disasters" and "peace of mind" than Americans in general, especially for the "illness and disasters" motive.[25] This suggests that both Japanese men and women are generally more apprehensive about old age than are their American counterparts.[26] More Japanese women save for "peace of mind" than Japanese men. This provides some support to the idea that Japanese women are more apprehensive than Japanese men. All these kinds of precautionary savings may be regarded as the "leftover" that is transferred in their bequest.

Table 3-5 Here

Regarding saving motives related to children, more Japanese parents save for their children's education and marriage but bequeath less than Americans parents. This suggests that human capital investments and *inter vivos* transfers are more prevalent than *post-mortem* bequests in Japan. Considering the higher inheritance tax in Japan mentioned by Niimi and Horioka (2018), in order to transfer more wealth to the next generation, parents may prefer to transfer wealth when they are still alive rather than have their children pay more taxes for the transfer after they pass away. Hence, Japanese parents are not necessarily purely self-interested in regard to intergenerational transfers. Under a different dimension, such as saving motives for children's education and marriage, Japanese parents may, in fact, be more altruistic than American parents.

Regarding life-cycle motives, more Japanese parents save for "nursing care." Particularly, more Japanese women save for "nursing care" than American women (Panel B). Along with the comparison in precautionary saving motives between American and Japanese women, these

[25] We cannot exclude the effect from the 2011 Great East Japan Earthquake, which may have increased awareness of unexpected misfortunes and led the Japanese to save for "illness and disasters."

[26] Saving for precautionary motives is considered to be a self-interested behavior following the Abel's (1985) model, in which utility from other family members does not enter an individual's utility function. Here, however, savings for unexpected expenditures can also be used for other family members. The "illness and disasters" saving motives shall therefore not be considered as purely self-interested.

results imply that Japanese women are more apprehensive about the future than American women. There is no significant country difference in saving motive for "Old age expenses," but Japanese males are more likely to save for this motive than Japanese females. Considering that recurring changes in the Japanese public pension system have resulted in a steady increase in pension insurance premiums for the younger generations and pension reductions for the older generations (Horioka, 2001), Japanese males are more anxious about old age living expenses. In terms of the 12 saving motives mentioned in the questionnaire, it appears that Japanese parents have greater saving motives than Americans, and this result is especially true for Japanese women compared to American women.

3.4.3. Possible explanations for the results

The saving motives results provide an explanation for the reason why the coefficient effects of FEMALE and CHILDNUM expand the gap in *Altruism*. Japanese females are more likely to save for precautionary and nursing care motives and are less likely to save for bequest motives than American females; accordingly, Japanese females are more likely to "leave whatever is left over," assuming that the "leftover" comes from saving for precautionary motives and for nursing care. Japanese parents are less likely to save for bequest motives; accordingly, the more children they have, the less likely they are to say that they will leave an inheritance no matter what.

Why does life expectancy matter? Construal Level Theory (CLT), which was introduced in a seminal paper by Trope and Liberman (2003), explains how temporal distance (near or distant future) affects individual decision making. Specifically, they find that distant future events are more likely to be construed as high-level (abstract, structured, goal relevant, desirable, etc.), whereas near future events are more likely to be construed as low-level (concrete, unstructured, goal irrelevant, feasible, etc.) (Fujita et al., 2006; Trope and Liberman, 2010; Trope et al., 2007). Leiser et al. (2008) describe CLT's implications for economic behaviors such as retirement savings, the annuity puzzle, and so on. For example, "leave an inheritance to children" in the

distant future would be regarded as an increase in the children's welfare, whereas a decrease in one's own consumption would be regarded as a near-future event. This idea suggests that, as life expectancy increases, leaving an inheritance becomes a distant future event and thus individuals are more likely to have an ideal, desirable, and altruistic plan. Hence, the probability of being altruistic monotonically increases in Japan.

The saving motive results also provide a clue to help explain the problem, namely, that CLT cannot explain the U-shape of *Altruism* observed in the US sample. One possible explanation is that, given that American parents tend to save as they age due to their bequest motives, they are then more likely to have savings to bequeath, which thus renders them more likely to leave an inheritance no matter what.[27]

The evidence from American and Japanese parents' saving motives suggests the following reasons in regard to why Japanese parents are more self-interested in bequest motives: 1) they are more apprehensive than Americans in the sense that more Japanese parents save for precautionary reasons and for "nursing care." This is especially true for Japanese women, who save for these reasons more so than American women do; 2) they are more likely to implement human capital investments and *inter vivos* transfers because Japanese parents more often save for their children's education and marriages than do American parents.

3.5. Conclusion and Discussion

This study investigates the attitudes of American and Japanese parents toward leaving an inheritance for their children. The evidence shows that there are significant inter-country and intra-country differences in the altruistic attitudes associated with bequest motivations. American parents are significantly more altruistic in terms of their bequest motives than are the Japanese, and Japanese women are less altruistic than men. The fact that the decrease in the probability of

[27] Individuals who decide to leave an inheritance no matter what are more likely to save following a bequest motive and, conversely, individuals who save following a bequest motive are also more likely to leave an inheritance no matter what when they pass away.

being altruistic is associated with the decrease in life expectancy is consistent with the CLT in the Japanese sample.

The raw difference in *Altruism* between Japanese and American parents in terms of bequest motives is 0.3268, and this statistically significant gap is mainly explained by the coefficient effect. The gaps in the coefficients of total effect of LIFEEXP, AGE65, HHINC, and FAITH shrink the gap, while the gaps in the coefficients of FEMALE and CHILDNUM tend to expand the gap in *Altruism* between the two countries.

There are two possible reasons why Japanese parents appear more self-interested than American parents in their bequest motives: 1) Japanese parents are more apprehensive and intend to save for precautionary motives, nursing care, and other expenses when one requires long-term care; 2) Japanese parents are more likely to save for human capital investments and *inter vivos* intergenerational transfers, such as their children's education and/or marriage, than for post-mortem bequest motives.

The findings that Japanese parents are more likely to leave whatever is left over to their children and that they primarily save for precautionary and nursing care motives suggest that accidental bequests are more prevalent in Japan. As De Nardi (2004) shows, accidental bequests alone do not induce wealth concentration more than voluntary bequests, so wealth inequality is less likely to widen via inheritances in Japan, but the transmission of ability via education will. On the contrary, American parents are more likely to leave an inheritance no matter what to their children, and the finding that that they primarily save for bequest motives suggests that the wealth inequality is more likely to widen via inheritances in the US. To reduce wealth inequality in the US, it is necessary to implement higher rates of bequest taxes and other relevant taxes to prevent tax evasion.

The findings also suggest that the sluggish economy and the aging population in Japan have made the Japanese more mindful about family financial planning for both their retirement and their children. According to the "Population Projections" from the Japan Statistical Yearbook

(2019), in 2050, there will be 101.9 million people in Japan. The population under 14-years-old will be 10.56% of the population and those aged 15-64 will be 51.75% of the population. There will be 37.68% of people in the population aged 65 and older. The shortage of health and long-term care workers and the mismatch in needs (e.g., a mismatch between demand and supply by region) results in Japanese people worrying about the soaring costs of nursing care and other related expenses that one requires for long-term care later in life. To alleviate such apprehension, it is urgent that the Japanese government conducts a rigorous study of demand and supply by region, revises caregivers' wages and social welfare, supports the training of foreigner caregivers, and provides foreign caregivers with efficient procedures so that they can apply and acquire residential status.

More Japanese women claim to "leave whatever is left over" and state that they have "no capacity to do so," while also having a tendency to save for precautionary motives and nursing/long-term care. These results suggest that their level of apprehension is important enough that it affects their bequest attitudes; therefore, a reasonable policy should aim to ease their apprehension. Hence, the policy implications from these results include encouraging women to participate in the labor force and alleviating gender inequality, which are both urgent issues in Japan. Compared to the US, which placed 19th, Japan placed 117th in the "Economic Participation and Opportunity" of the World Economic Forum's "The Global Gender Gap Report 2018."[28] The Japanese government should therefore promote policies (e.g., paternity leave for men) to reduce the gender discrimination in income and labor force participation.

The bequest motives hinge on savings behavior, while at the same time savings behavior affect bequest motives. Due to data limitations, the amount of the bequest and savings for each motive cannot be scrutinized at present. Further research on this topic might give us more detailed explanations and policy implications.

[28] "The Global Gender Gap Report 2018" is available from https://www.weforum.org/reports/the-global-gender-gap-report-2018.

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Table 3-1 How do you feel about leaving an inheritance to your children? (%)

Bequest Motives	US				Japan					US-JP	
	All	Female	Male	F-M	All	Female	Male	F-M			
Altruism	***59.02***	***58.63***	***59.48***	***-0.85***	***30.06***	***25.39***	***34.95***	***-9.56***	***	***28.95***	***
Leave an inheritance no matter what	58.81	58.48	59.20	-0.71	29.09	24.36	34.03	-9.67	***	29.72	***
Tough love	0.21	0.15	0.28	-0.13	0.97	1.03	0.92	0.11		-0.77	***
Self-interest	***30.08***	***29.79***	***30.43***	***-0.64***	***51.27***	***53.49***	***48.96***	***4.54***	**	***-21.20***	***
Leave an inheritance if children provide care	1.06	0.95	1.20	-0.25	2.34	2.43	2.24	0.19		-1.28	***
Leave an inheritance if children provide assistance	0.19	0.21	0.16	0.06	0.40	0.33	0.47	-0.14		-0.22	
Leave whatever is left over	28.21	28.20	28.21	0.00	47.82	50.17	45.36	4.81	**	-19.61	***
Use my wealth myself	0.63	0.43	0.86	-0.44	0.72	0.56	0.88	-0.32		-0.09	
Dynasty building	***0.28***	***0.11***	***0.48***	***-0.38***	***0.79***	***0.60***	***0.98***	***-0.38***		***-0.51***	**
Leave an inheritance to the one carrying on the family business	0.28	0.11	0.48	-0.38	0.79	0.60	0.98	-0.38		-0.51	**
Other	***10.63***	***11.48***	***9.61***	***1.87***	***17.87***	***20.52***	***15.11***	***5.40***	***	***-7.25***	***
No capacity to do so	10.63	11.48	9.61	1.87	17.87	20.52	15.11	5.40	***	-7.25	***
Number of observations	1,508	802	706		3,369	1,789	1,580				

* p < 0.1, ** p < 0.05, *** p < 0.01

Notes:

1. The analysis only includes those who stated that “I have a spouse (husband or wife, including common-law marriage)” in the survey.
2. The analysis excludes those who do not have children in the family.
3. The data is weighted by sampling weights.

Table 3-2 Summary Statistics

	Description	US		Japan	
		Mean	S.D.	Mean	S.D.
Altruism	1 = Altruism, 0 = Self-interest	0.6613	0.4735	0.3345	0.4719
FEMALE	1 = Female, 0 = Male	0.5156	0.5000	0.5082	0.5000
AGE	Respondent's age	56.9911	13.8861	55.3305	11.6699
LIFEEXP	Life expectancy at each age	26.4024	11.3069	30.2266	11.0803
AGE65	1 = Respondent aged 65 or older, 0 = otherwise	0.2779	0.4482	0.2525	0.4345
HHINC	Approximately how much was the annual earned income before taxes and with bonuses included of your entire household for 2011?	10.9724	0.8344	10.8826	0.6091
FAITH	I am deeply religious (Recoded as 1. Does not hold true at all for me - 5. Particularly true for me)	3.1314	1.3334	1.6687	1.0233
CHILDNUM	Number of children in the family	2.5603	1.5453	2.1641	0.7127
NOHIGH	Education Dummy: Did not reach high school	0.0322	0.1765	0.0844	0.2781
HIGHSCH	Education Dummy: High school	0.5836	0.4932	0.6515	0.4766
COLLEGE	Education Dummy: College or higher	0.3843	0.4866	0.2641	0.4409
Observations		1,119		2,499	

Notes:
1. The analysis only includes those who stated that “I have a spouse (husband or wife, including common-law marriage)” in the survey.
2. The analysis excludes those who do not have children in the family.
3. The number of children in the family is the aggregated number of sons and daughters.
4. The household income in 2011 (HHINC) is converted into USD by 2011 PPP and taken as a natural logarithm in the analysis.

Table 3-3 Who Has More Altruistic Bequest Motives?

	Altruism		
	LPR Coefficient	Probit Coefficient	Margins at mean Margins
COUNTRY (US=0, Japan=1)	-1.2368***	-3.4559***	-0.2994***
	(0.32)	(0.92)	(0.03)
FEMALE	0.0339	0.0916	-0.1015***
	(0.03)	(0.08)	(0.02)
LIFEEXP	-0.0204***	-0.0590***	0.0048***
	(0.01)	(0.02)	(0.00)
LIFEEXP × LIFEEXP	0.0003***	0.0009***	
	(0.00)	(0.00)	
AGE65	-0.1238**	-0.3468**	-0.0361
	(0.06)	(0.16)	(0.04)
HHINC	-0.0126	-0.0345	0.0215
	(0.02)	(0.05)	(0.01)
FAITH	-0.0108	-0.0298	0.0151*
	(0.01)	(0.03)	(0.01)
CHILDNUM	-0.0028	-0.0082	-0.0413***
	(0.01)	(0.02)	(0.01)
Education (omitted: COLLEGE)			
NOHIGH	-0.1078	-0.2951	-0.0547
	(0.09)	(0.23)	(0.04)
HIGHSCH	-0.0660**	-0.1827**	-0.0483**
	(0.03)	(0.09)	(0.02)
Interactions			
Japan × FEMALE	-0.1818***	-0.5116***	
	(0.04)	(0.10)	
Japan × LIFEEXP	0.0261***	0.0732***	
	(0.01)	(0.03)	
Japan × LIFEEXP × LIFEEXP	-0.0003**	-0.0008*	
	(0.00)	(0.00)	
Japan × AGE65	0.1360*	0.3667*	
	(0.07)	(0.20)	
Japan × HHINC	0.0448*	0.1301*	
	(0.03)	(0.07)	
Japan × FAITH	0.0350**	0.0993**	
	(0.01)	(0.04)	
Japan × CHILDNUM	-0.0506***	-0.1421***	
	(0.02)	(0.05)	
Japan × NOHIGH	0.0827	0.2240	
	(0.09)	(0.26)	
Japan × HIGHSCH	0.0307	0.0854	
	(0.04)	(0.11)	
Constant	1.1851***	1.9025***	
	(0.25)	(0.69)	
Observations	3618	3618	3618
Adjusted R^2 or Pseudo R^2	0.1288	0.0977	

* p < 0.1, ** p < 0.05, *** p < 0.01. Robust standard errors in parentheses.

Table 3-4 Blinder–Oaxaca Decomposition of Altruism in the US and Japan

Dependent Variable:	Altruism		
	US	Japan	Difference
	0.6613***	0.3345***	0.3268***
	(0.01)	(0.01)	(0.02)
Observations	1119	2499	
	US - Japan Comparison		
	Endowments	Coefficients	Interaction
Overall:	-0.0090	0.3245***	0.0113
	(0.02)	(0.02)	(0.02)
Details:			
FEMALE	-0.0011	0.0924***	0.0014
	(0.00)	(0.02)	(0.00)
LIFEEXP	-0.0221	-0.7903***	0.1000***
	(0.03)	(0.29)	(0.04)
LIFEEXP × LIFEEXP	-0.0070	0.2831**	-0.0578*
	(0.02)	(0.14)	(0.03)
AGE65	0.0003	-0.0343*	-0.0035
	(0.00)	(0.02)	(0.00)
HHINC	0.0029	-0.4872*	-0.0040
	(0.00)	(0.28)	(0.00)
FAITH	0.0354***	-0.0584**	-0.0512**
	(0.01)	(0.02)	(0.02)
CHILDNUM	-0.0211***	0.1094***	0.0200***
	(0.01)	(0.04)	(0.01)
Education (omitted: COLLEGE)			
NOHIGH	0.0013	-0.0070	0.0043
	(0.00)	(0.01)	(0.00)
HIGHSCH	0.0024	-0.0200	0.0021
	(0.00)	(0.03)	(0.00)
Constant		1.2368***	
		(0.32)	
Observations	3618		

* p < 0.1, ** p < 0.05, *** p < 0.01.

Table 3-5 Saving Motives in the US and Japan (weighted)

Panel A

Saving Motives	US					Japan					US-JP	
	All	Female	Male	F-M		All	Female	Male	F-M			
Precautionary	***0.9008***	***0.8722***	***0.9458***	***-0.0737***		***1.3643***	***1.3909***	***1.3166***	***0.0744***		***-0.4636***	***
Illnesses and disasters	0.5284	0.4906	0.5881	-0.0976		0.7851	0.7665	0.8184	-0.0519		-0.2566	***
Peace of mind	0.3723	0.3816	0.3577	0.0239		0.5793	0.6245	0.4982	0.1263	**	-0.2069	***
For Children	***0.6338***	***0.5525***	***0.7618***	***-0.2092***	*	***0.8770***	***0.9058***	***0.8253***	***0.0805***		***-0.2432***	***
Children's education	0.3384	0.3066	0.3884	-0.0818		0.5401	0.5641	0.4970	0.0671		-0.2017	***
Children's marriage	0.0530	0.0549	0.0500	0.0049		0.2167	0.2379	0.1787	0.0592		-0.1638	***
Bequest	0.2424	0.1910	0.3234	-0.1323	*	0.1202	0.1038	0.1496	-0.0458		0.1222	***
Life-cycle	***1.9458***	***1.7985***	***2.1779***	***-0.3794***		***1.9347***	***1.8485***	***2.0894***	***-0.2410***		***0.0111***	
Marriage	0.0601	0.0404	0.0912	-0.0508		0.0091	0.0073	0.0122	-0.0049		0.0510	**
Housing	0.2304	0.2495	0.2002	0.0492		0.2870	0.2641	0.3280	-0.0639		-0.0566	
Old age expenses	0.6511	0.6191	0.7016	-0.0825		0.5759	0.5275	0.6629	-0.1355	***	0.0752	*
Nursing care	0.2072	0.1732	0.2608	-0.0876		0.3339	0.3179	0.3626	-0.0447		-0.1267	***
Consumer durables	0.3870	0.3541	0.4390	-0.0849		0.3793	0.3829	0.3729	0.0100		0.0078	
Leisure	0.4099	0.3622	0.4851	-0.1229		0.3495	0.3488	0.3507	-0.0020		0.0604	
Others	***0.1479***	***0.1210***	***0.1902***	***-0.0692***		***0.1812***	***0.1592***	***0.2208***	***-0.0616***		***-0.0334***	
Other	0.1479	0.1210	0.1902	-0.0692		0.1812	0.1592	0.2208	-0.0616		-0.0334	
Total 12 Motives	***3.6282***	***3.3442***	***4.0757***	***-0.7315***	*	***4.3572***	***4.3044***	***4.4520***	***-0.1477***		***-0.7290***	***
Number of observations	262	174	88			610	385	225				

* p < 0.1, ** p < 0.05, *** p < 0.01.

Panel B

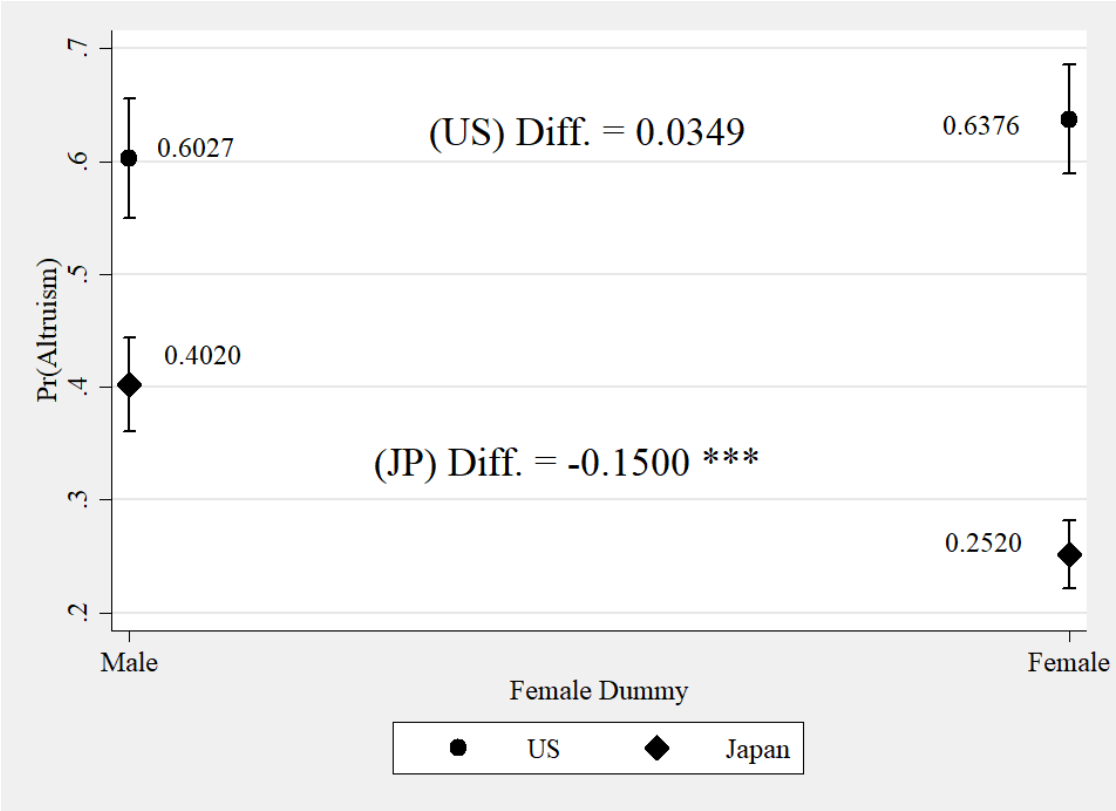
Saving Motives	Female				Male			
	US	Japan	US-JP		US	Japan	US-JP	
Precautionary	***0.8722***	***1.3909***	***-0.5188***	***	***0.9458***	***1.3166***	***-0.3707***	***
Illnesses and disasters	0.4906	0.7665	-0.2759	***	0.5881	0.8184	-0.2303	***
Peace of mind	0.3816	0.6245	-0.2429	***	0.3577	0.4982	-0.1404	*
For Children	***0.5525***	***0.9058***	***-0.3532***	***	***0.7618***	***0.8253***	***-0.0635***	
Children's education	0.3066	0.5641	-0.2575	***	0.3884	0.4970	-0.1085	
Children's marriage	0.0549	0.2379	-0.1831	***	0.0500	0.1787	-0.1287	***
Bequest	0.1910	0.1038	0.0873	**	0.3234	0.1496	0.1738	***
Life-cycle	***1.7985***	***1.8485***	***-0.0499***		***2.1779***	***2.0894***	***0.0885***	
Marriage	0.0404	0.0073	0.0330	**	0.0912	0.0122	0.0789	*
Housing	0.2495	0.2641	-0.0146		0.2002	0.3280	-0.1278	**
Old age expenses	0.6191	0.5275	0.0916	*	0.7016	0.6629	0.0387	
Nursing care	0.1732	0.3179	-0.1447	***	0.2608	0.3626	-0.1018	
Consumer durables	0.3541	0.3829	-0.0287		0.4390	0.3729	0.0661	
Leisure	0.3622	0.3488	0.0134		0.4851	0.3507	0.1343	*
Others	***0.1210***	***0.1592***	***-0.0382***		***0.1902***	***0.2208***	***-0.0306***	
Other	0.1210	0.1592	-0.0382		0.1902	0.2208	-0.0306	
Total 12 Motives	***3.3442***	***4.3044***	***-0.9601***	***	***4.0757***	***4.4520***	***-0.3763***	
Number of observations	174	385			88	225		

* p < 0.1, ** p < 0.05, *** p < 0.01.

Notes:

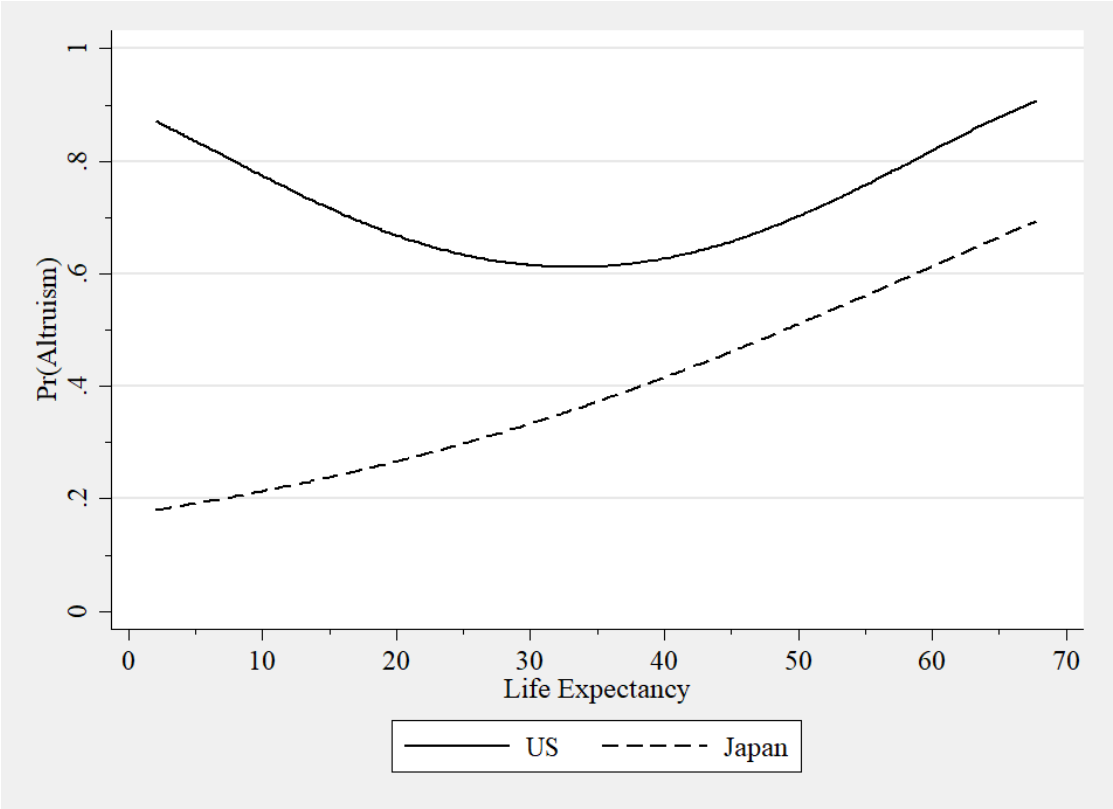
1. Weighted by sampling weights
2. The 12 saving motives are all dummy variables, and the results are shown as their mean values. “Precautionary,” “For Children,” “Life-cycle,” and “Total 12 Motives” represent the dummies’ aggregate values.

Figure 3-1 Gender Difference in the US and Japan (Adjusted Prediction with 95% CIs)



* p < 0.1, ** p < 0.05, *** p < 0.01.

Figure 3-2 Shape of the Effect of Life Expectancy



3.7. Appendix

Appendix 3-1: Robustness Check for Determinants of Bequest Motives

This section describes the robustness check that was conducted via analyzing the determinants of the four bequest motives, as listed in Table 3-1. This section provides the results of a multinomial logistic regression (MNL) that was conducted with the same independent variables used in the previous section. The dependent variable $BM_{c,i}$ represents the bequest motive of individual i in country c, and it equals 1 if the individual has an altruistic bequest motive, equals 2 if he/she has a self-interest motive, equals 3 if he/she has dynasty-building motive, and equals 4 if he/she says, "no capacity to do so." $\boldsymbol{X_i}$ represents the same vector of socio-economic characteristics as in equation (3-1).

$$BM_{c,i} = \alpha_c + \gamma' \mathbf{X_{c,i}} + \varepsilon_{c,i}$$

Table 3-A1 Here

Table 3-A1 presents the results of the multinomial logistic regression with *Altruism* as the reference category. The regression results are shown as relative risk ratios (*RRR*). The *RRR* measures (with a one-unit change in the corresponding variable) the risk of the outcome of the comparison category compared to the outcome of the reference category, holding all other independent variables in the model constant. For example, the *RRR* of FEMALE in the outcome of the *Self-interest* category in Japan means:

$$RRR = \frac{\frac{Pr\,(Self-interest|female)}{Pr\,(Altruism|female)}}{\frac{Pr\,(Self-interest|male)}{Pr\,(Altruism|male)}} = 2.0193$$

This result shows that Japanese women are more likely than Japanese men to display self-interested or other (e.g., no capacity to leave an inheritance) bequest motives instead of altruistic ones. In contrast, American women show no significant differences compared to American men. LIFEEXP shows an inverted U-shaped effect on self-interest in the US and having no capacity to leave an inheritance in both countries. Parents in wealthier families are less likely to say that they have no capacity to leave an inheritance than the poor. Pious Japanese parents are more likely to

have altruistic bequest motives than self-interested ones. Fixing all other variables, if a Japanese person were to increase his/her number of children by one, the relative risk for having *Self-interest*, *Dynasty*, and *Other* to *Altruism* would be expected to increase by a factor of 1.2782, 2.7054, and 1.4814, respectively. Also, well-educated American and Japanese parents are less likely to state that they are incapable of bequeathing.

In the intra-country analysis, I find that gender, life expectancy, household income, religious faith, number of children, and educational attainment have a significant impact on bequest motives.

The results of the MNL regression are very similar to those of the LPR and probit regressions in Table 3-3, namely, Japanese women are more self-interested and there is no gender difference in the US. The results in section 3.3.2 can therefore be accepted as robust.

Table 3-A1 Bequest Motives of Japanese and American Parents (Multinomial Logit Regression. Omitted Category: "Altruism")

	US			Japan		
	Self interest	Dynasty	No Capacity	Self interest	Dynasty	No Capacity
FEMALE	0.8567	0.3982	0.9223	2.0193***	1.5480	1.6176***
	(0.11)	(0.53)	(0.20)	(0.21)	(0.58)	(0.21)
LIFEEXP	1.0994**	1.1503	1.1460*	0.9762	0.9013	1.1016*
	(0.04)	(0.26)	(0.06)	(0.03)	(0.12)	(0.05)
LIFEEXP × LIFEEXP	0.9986**	0.9977	0.9983*	0.9998	1.0005	0.9986*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
AGE65	1.7364*	1.8057	1.8007	0.9710	0.9522	0.9036
	(0.46)	(5.24)	(0.80)	(0.18)	(0.64)	(0.22)
HHINC	1.0601	2.4773	0.4835***	0.8463	1.3279	0.4504***
	(0.10)	(2.64)	(0.05)	(0.07)	(0.56)	(0.05)
FAITH	1.0521	0.7566	1.0098	0.8894**	0.9332	0.9531
	(0.05)	(0.19)	(0.08)	(0.04)	(0.15)	(0.05)
CHILDNUM	1.0131	0.9459	1.0593	1.2782***	2.7054***	1.4814***
	(0.04)	(0.22)	(0.06)	(0.08)	(0.53)	(0.12)
Education (omitted: COLLEGE)						
NOHIGH	1.6308	82.0057*	7.7936***	1.1525	8.4501**	3.1388***
	(0.61)	(149.75)	(3.65)	(0.22)	(5.99)	(0.76)
HIGHSCH	1.3576*	1.1987	3.8676***	1.1576	3.4511	1.7619***
	(0.19)	(2.27)	(1.19)	(0.12)	(2.23)	(0.27)
Constant	0.0451**	0.0000	10.5330	14.5405*	0.0006	178.6014***
	(0.05)	(0.00)	(15.94)	(15.14)	(0.00)	(232.52)
Observations	1248			3054		
Pseudo R^2	0.0563			0.0508		

* p < 0.1, ** p < 0.05, *** p < 0.01. Coefficients are shown as Relative Risk Ratios. Robust standard errors in parentheses.

Notes:

1. The analysis only includes those who stated that "I have a spouse (husband or wife, including common-law marriage)" in the survey.
2. The analysis excludes those who do not have children in the family.
3. The number of children in the family is the aggregated number of sons and daughters.

Chapter 4.
The Effect of the Source of Inheritance on Bequest Attitudes: Evidence from Japan

Abstract

A better understanding of the reasons for bequests can be pivotal for the effectiveness of fiscal policy and wealth inequality management as the different bequest motives underlying bequest behavior have different implications. This study examines community-based indirect reciprocity in bequest attitudes over three generations. The theoretical model, called community-based family tradition, suggests that the source of the inheritance impacts the amount of the bequest left to one's children or one's spouse. The study empirically analyzes survey data from the 2009 wave of the Preference Parameters Study for Japan. The results suggest that with some socio-economics characteristics controlled, those who have received an inheritance from their parents are more likely to intend to bequest as much as possible to their children, while those who have received an inheritance from their spouse's parents are more likely to intend to bequest as much as possible to both their children and their spouse. Hence, the source of inheritance does affect bequest attitudes, which suggests that there is community-based indirect reciprocity in bequest attitudes. The empirical results from the gender comparison suggest that the taxation on inheritance is less functional for females than for males.

Keywords: Inheritance; Bequest attitudes; Community; Family tradition; Indirect reciprocity

JEL classification: D11; D12; D64

4.1. Introduction

A better understanding of the reasons for bequests can be pivotal for the effectiveness of fiscal policy and wealth inequality management as the different bequest motives underlying bequest behavior have divergent implications. For example, Ricardian equivalence will not hold if bequests are driven by self-interest motives, but will hold if they are driven by altruistic motives (Horioka, 2002, 2014). Moreover, family tradition in bequeathing behavior may moderate the effectiveness of the inheritance/estate tax (Stark and Nicinska, 2015), while wealth inequality could grow due to voluntary bequests (De Nardi, 2004).

The reasons why individuals leave bequests have been examined extensively in the literature and the motives, which involve two generations, have been categorized largely into self-interest and altruism. However, the extant empirical results have been mixed. Some studies support the self-interest bequest motive (Bernheim et al., 1985; Cox, 1987; Hurd, 1997) while others support the altruistic one (Page, 2003; Tomes, 1981).

Another similar research stream has focused on intended bequest behavior involving three generations, which provides a new perspective concerning "family tradition" (Arrondel and Grange, 2014; Cox and Stark, 2005; DeBoer and Hoang, 2017; Niimi and Horioka, 2018; Stark and Nicinska, 2015). These studies demonstrate that intended bequest behavior is positively associated with retrospective inheritance experience, and provide evidence of indirect reciprocity in financial transfer behavior within the family (Arrondel and Masson, 2001; Bethencourt and Kunze, 2019).

These studies concerning family tradition examine the retrospective inheritance experience as a whole irrespective of the source of the inheritance. However, mental accounting theory suggests that the source matters, as the principle of fungibility is violated across mental accounts (Thaler, 1985). Further, laboratory experiments of the one-shot dictator game confirm the salience of the source (Cherry, 2001; Cherry et al., 2002). This study fills this gap in the literature by taking the inheritance source into consideration.

This study aims to examine if there is community-based indirect reciprocity in the bequest attitude (hereafter "BA") involving three generations. Community is identified by consanguineal kinship within the family (see Figure 4-1). The first community involves the respondent's parents, the respondent, and the child(ren) (hereafter "P-R-C community"); the second community involves the respondent's spouse's parents, the respondent's spouse, and the child(ren) (hereafter "SP-S-C community"). Community-based indirect reciprocity is identified through the different effects of the source of the inheritance, for example, the experience of receiving a bequest from either the respondent's parents or spouse's parents, on an individual's BA toward children or spouse.

Figure 4-1 Here

According to the self-interest model, the experience of inheritance will not increase the respondent's positive BA toward children or spouse when income and wealth are controlled; neither will the source of the inheritance, since the utilities from other family members will not enter the exclusively self-interested individual's utility function. According to the altruistic model, the experience of inheritance may augment positive BA toward children and/or spouse when the expected utility gains from other family members exceed the expected disutility of the individual due to bequests since the utility from children and/or spouse directly enters the individual's utility function. However, the source of the inheritance is irrelevant to the BA in the altruistic model since "altruism is a form of unconditional kindness" (Fehr and Gächter, 2000b, p.160) and altruistic behavior is not a reaction to others' behavior. Hence, BA toward children and spouse are unaffected by the source of the inheritance.[29]

This study provides a theoretical model, called the community-based family tradition model, considering community-based indirect reciprocity by extending the "family tradition" model of

[29] For simplicity, this study does not consider the tough love (Bhatt and Ogaki, 2012) reason for the unwillingness of bequeathing as much as possible to children and/or spouse; for example, leaving too much may sabotage self-development. Moreover, the empirical results suggest that the proportion of "tough love" is relatively limited (Horioka, 2014).

Stark and Nicinska (2015). The community-based family tradition model suggests that the source of inheritance has a different impact on bequeathing.

It then uses survey data from the 2009 wave of the Preference Parameters Study of Osaka University in Japan for empirical analysis. The BA is measured by respondent agreement or disagreement with the statements concerning leaving children/spouse as much inheritance as possible. The empirical results suggest that those who have received an inheritance from their parents tend to have a higher BA toward children, while those who have received an inheritance from their spouse's parents tend to have a higher BA toward both their children and spouse.

This study contributes to the theoretical and empirical evidence by showing that the source of the inheritance has a different impact on BA toward children and spouse, which cannot be observed in either the altruistic or joy of giving models. This study considers community-based indirect reciprocity in terms of BA to enhance our understanding of what motivates people to leave a bequest.

The paper is organized as follows. Section 4.2 reviews the literature. Section 4.3 develops the theoretical models, followed by the data and sample selection criteria in Section 4.4. Section 4.5 and Section 4.6 provide the empirical framework and results, respectively. Section 4.7 interprets the results in terms of the community-based family tradition model. Section 4.8 concludes with a discussion of the study.

4.2. Literature Review

4.2.1. Intergenerational Transfers Involving Two Generations

Theoretical and empirical studies involving two generations reveal two paramount motives: self-interest and altruism. Under the self-interest motive hypothesis, some literature suggests that individuals have no bequest motives but leave accidental bequests due to lifetime uncertainty (Abel, 1985; Davies, 1981; Hurd, 1997; Laitner, 2002; Yaari, 1965). However, other literature suggests these bequests are intentional (Gale and Scholz, 1994; Page, 2003). Some studies also

suggest that individuals use bequests to wield influence on children's behavior, such as gaining the attention of their children and/or paying for services provided by their children, called the "strategic bequest motive" (Bernheim et al., 1985). The empirical results on this are mixed as some evidence supports the strategic bequest motive (Angelini, 2007; Bernheim et al., 1985; Cox, 1987; Cox and Rank, 1992; Horioka et al., 2018; Kotlikoff and Morris, 1989; Yamada, 2006); while some does not (Arrondel and Masson, 2001; Perozek, 1998; Sloan et al., 1997; Tomes, 1981).

Under the altruistic motive hypothesis, some literature suggests impure altruistic individual utility is driven by the size of the bequest, called the "joy of giving" (Abel and Warshawsky, 1988; Laitner, 2002), also called the egoistic model (Laitner and Ohlsson, 2001), or warm-glow giving (Andreoni, 1990). Others have suggested that post-mortem intergenerational transfers are motivated by altruism where a benevolent parent cares about family members' utilities (Barro, 1974; Becker, 1974). Some empirical literature supports the altruistic reason (MacDonald and Koh, 2003; Tomes, 1981), but others find little evidence to support such an idea (Wilhelm, 1996). Thus, as current studies provide mixed empirical results, there appears to be no consensus among scholars regarding the reasons why parents leave bequests to their children.

4.2.2. Intergenerational Transfers Involving Three Generations

Some studies have investigated the family tradition in bequest behavior involving three generations, showing the positive effects of an inheritance from previous generations on the intention to leave bequests to children. For example, using data from the U.S. Health and Retirement Survey, Cox and Stark (2005) find that both intention to bequeath and the probability of making a bequest of USD 100,000 or more correlate positively with the experience of receiving an inheritance and the experience of receiving an inheritance of USD 100,000 or more, respectively.

Arrondel and Grange (2014) study the inheritance–bequest relation using data from 19th century western France. They investigate whether the expected value of the bequest positively correlates with the inheritance amount received.

Stark and Nicinska (2015) examine data from the Survey on Health, Ageing and Retirement in Europe. Their empirical results, based on European survey data, confirm a positive effect of the experience of inheriting on the intention to bequeath.

DeBoer and Hoang (2017), using 1998 to 2010 waves of triennial data from the Survey of Consumer Finance collecting information from U.S. families, show similar results that those who have received an inheritance are more likely to expect to leave a bequest. However, Kao et al. (1997), who use the 1998 wave of the Survey of Consumer Finance, and regress the probability of expecting to leave an inheritance in terms of "yes," "possibly," and "no" on the amount of inheritance received, do not find a significant result between these two variables.

Niimi and Horioka (2018) analyze the expectation of leaving an inheritance using the 2010 wave Preference Parameters Study of Osaka University for the US and Japan and show that the receipt of intergenerational transfer increases the probability of bequeathing in these countries. Thus, such family traditions have been verified in many studies and thereby provide us with another explanation of bequests aside from self-interest and/or altruistic reasons.

4.2.3. Fairness and Indirect Reciprocity

Fairness consideration has been documented substantially in the literature (Fehr and Gächter, 2000b; Fehr and Schmidt, 1999; Kahneman et al., 1986; Rees, 1993). In addition, evidence from experiments, such as the ultimate game, the public goods game, and the trust game, suggest that an individual's behavior may be affected by fairness considerations (Fahr and Irlenbusch, 2000; Falk et al., 2003; Fehr and Fischbacher, 2003; Fehr and Gächter, 2000a). According to fairness considerations, positive or negative reciprocal behavior is motivated by how nice or mean someone is to you (Falk et al., 2003; Fehr and Gächter, 2000b).

Direct reciprocity is an interaction between the same two individuals while indirect reciprocity involves more than two (Nowak and Sigmund, 2005). Indirect reciprocity has been categorized into downstream reciprocity and upstream reciprocity. Downstream reciprocity can be observed in many experiments where a third party rewards (punishes) a player who has been benign (hostile) to another (Engelmann and Fischbacher, 2009; Seinen and Schram, 2006). According to Nowak and Sigmund (2005), upstream reciprocity is based on a previous experience where an individual receives help from a person and then passes on the benevolence to someone else.

Hence, the family tradition of bequeathing can be labeled upstream reciprocity, where parents leave a bequest to individuals and incentivize the individuals to leave a bequest to their children and/or spouse. Considering that the inheritance from the individuals' own parents and their spouse's parents may trigger different routes of upstream reciprocity, this study provides a unique contribution to the literature by analyzing the correlation between the source of the inheritance and the intended bequest.

4.3. Theoretical Model

The study's theoretical model concerning "family tradition" connected with community-based indirect reciprocity is identified by consanguineal kinship within the family. Stark and Nicinska (2015) propose a "family tradition" bequest model where an individual's utility depends positively on personal consumption, child consumption, and continuing the family tradition to bequeath. This model predicts that individuals with a family tradition plan to bequest more than those without a family tradition.

Considering the theory of mental accounting (Thaler, 1985, 1990, 1999), monies received from a respondent's parents and a spouse's parents are assumed to be placed into respective accounts. Community-based indirect reciprocity, in accordance with the fairness consideration, presumes that once the respondent has received an inheritance from his/her own (spouse's) parents, he/she

is more willing to leave an adequate bequest to his/her child (child and spouse). This denotes the P-R-C (SP-S-C) community.

The individual's utility U depends positively on: personal consumption $y_i + h_p + h_{sp} - b_c - b_s$; the consumption of the child $y_c + b_c$; the consumption of the spouse $y_s + b_s$; and the family tradition of bequeathing $b_c - \theta \times h_p - \gamma_c \times h_{sp}$ and $b_s - \gamma_s \times h_{sp}$; where y represents income; h represents the inheritance received; p and sp denote the source of inheritance from the individual's parents and spouse's parents, respectively; b represents the bequest; and c and s denote child and spouse, respectively.

This captures that the child is the first line in the bequests in the P-R-C community and second line in the SP-S-C community. The spouse is not in the P-R-C community but is the first line in the SP-S-C community.

Here, the general utility function for each individual is given as:

$$U(b_c, b_s) = (1 - \alpha_c - \alpha_s) \times Log\left(y_i + h_p + h_{sp} - b_c - b_s\right) + \alpha_c \times Log(y_c + b_c) + \beta_c \times Log(b_c - \theta \times h_p - \gamma_c \times h_{sp}) + \alpha_s \times Log(y_s + b_s) + \beta_s \times Log(b_s - \gamma_s \times h_{sp})$$

The higher the b to the child and/or spouse, the higher the BA is. The parameters $\alpha_c, \alpha_s \geq 0$ and $(1 - \alpha_c - \alpha_s) > 0$ measure altruism. $\beta_c, \beta_s \geq 0$ measures family tradition. $0 \leq \theta, \gamma_c, \gamma_s \leq 1$ and $\gamma_c + \gamma_s \leq 1$ where θ and γ_c measure the weights assigned to the child in the P-R-C and SP-S-C communities, and γ_s measures the weight assigned to the spouse in the SP-S-C community. For simplicity, the general model is separated into three cases: a pure altruistic model, a pure joy of giving model, and a pure community-based family tradition (hereafter "CBFT") model.

4.3.1. Pure Altruistic Model

In the case of pure altruism $(\beta_c = \beta_s = 0)$, $\alpha_c, \alpha_s,$ and $(1 - \alpha_c - \alpha_s) > 0$, an individual considers choosing the amount of the bequest for the child and the spouse to maximize the utility function, given as,

$$U(b_c, b_s) = (1 - \alpha_c - \alpha_s) \times Log\left(y_i + h_p + h_{sp} - b_c - b_s\right)$$
$$+ \alpha_c \times Log(y_c + b_c) + \alpha_s \times Log(y_s + b_s)$$

Then, utility $U(b_c, b_s)$ will reach its maximum (see proof in Appendix 4-1A) when

$$b_c{}^* = -y_c + (h_p + h_{sp} + y_c + y_i + y_s)\alpha_c$$
$$b_s{}^* = -y_s + (h_p + h_{sp} + y_c + y_i + y_s)\alpha_s$$

If the inheritance from the respondent's parents increases by Δ, the optimal bequests to the child and spouse are $b^*_{c,h_p+\Delta}$ and $b^*_{s,h_p+\Delta}$, respectively; then, the bequest to the child and spouse increases respectively by

$$b^*_{c,h_p+\Delta} - b^*_c = \alpha_c \Delta$$
$$b^*_{s,h_p+\Delta} - b^*_s = \alpha_s \Delta$$

If the inheritance from the spouse's parents increases by Δ, the optimal bequests to the child and spouse are $b^*_{c,h_{sp}+\Delta}$ and $b^*_{s,h_{sp}+\Delta}$, respectively; then, the bequest to the child and spouse increases respectively by

$$b^*_{c,h_{sp}+\Delta} - b^*_c = \alpha_c \Delta$$
$$b^*_{s,h_{sp}+\Delta} - b^*_s = \alpha_s \Delta$$

The differences in the bequests with respect to the difference in the source of the inheritance are

$$\left[b^*_{c,h_p+\Delta} - b^*_c\right] - \left[b^*_{c,h_{sp}+\Delta} - b^*_c\right] = \alpha_c \Delta - \alpha_c \Delta = 0$$
$$\left[b^*_{s,h_p+\Delta} - b^*_s\right] - \left[b^*_{s,h_{sp}+\Delta} - b^*_s\right] = \alpha_s \Delta - \alpha_s \Delta = 0$$

Hence, in the case of pure altruism, the source of inheritance does not affect an individual's bequests.

4.3.2. Pure Joy of Giving Model

In the case of the pure joy of giving ($\alpha_c = \alpha_s = 0$), $\theta, \gamma_c, \gamma_s = 0$, and $\beta_c, \beta_s > 0$. $Log(b_c)$ and $Log(b_s)$ are motivated by "warm-glow giving" (Andreoni, 1990). An individual considers choosing the amount of the bequests to the child and spouse to maximize the utility function, given as:

$$U(b_c, b_s) = Log\big(y_i + h_p + h_{sp} - b_c - b_s\big) + \beta_c \times Log(b_c) + \beta_s \times Log(b_s);$$

then, the utility $U(b_c, b_s)$ will reach its maximum (see proof in Appendix 4-1B) when

$$b_c{}^* = \frac{(h_p + h_{\text{sp}} + y_i)\beta_c}{1 + \beta_c + \beta_s}$$
$$b_s{}^* = \frac{(h_p + h_{\text{sp}} + y_i)\beta_s}{1 + \beta_c + \beta_s}$$

If the inheritance from the respondent's parents increases by Δ, the bequest to the child and spouse increases respectively by

$$b^*_{c,h_p+\Delta} - b^*_c = \frac{\beta_c \Delta}{1 + \beta_c + \beta_s}$$
$$b^*_{s,h_p+\Delta} - b^*_s = \frac{\beta_s \Delta}{1 + \beta_c + \beta_s}$$

If the inheritance from the spouse's parents increases by Δ, the bequest to the child and spouse increases respectively by

$$b^*_{c,h_{sp}+\Delta} - b^*_c = \frac{\beta_c \Delta}{1 + \beta_c + \beta_s}$$
$$b^*_{s,h_{sp}+\Delta} - b^*_s = \frac{\beta_s \Delta}{1 + \beta_c + \beta_s}$$

The differences in the bequest with respect to the difference in the source of inheritance are:

$$\left[b^*_{c,h_p+\Delta} - b^*_c\right] - \left[b^*_{c,h_{sp}+\Delta} - b^*_c\right] = \frac{\beta_c \Delta}{1 + \beta_c + \beta_s} - \frac{\beta_c \Delta}{1 + \beta_c + \beta_s} = 0$$
$$\left[b^*_{s,h_p+\Delta} - b^*_s\right] - \left[b^*_{s,h_{sp}+\Delta} - b^*_s\right] = \frac{\beta_s \Delta}{1 + \beta_c + \beta_s} - \frac{\beta_s \Delta}{1 + \beta_c + \beta_s} = 0$$

Hence, in the case of the pure joy of giving, the source of inheritance does not affect the individual's bequests.

4.3.3. Pure CBFT Model

In the case of the pure CBFT $(\alpha_c = \alpha_s = 0),\ \beta_c, \beta_s > 0,\ 0 < \gamma_s \leq 1,\ |\theta| + |\gamma_c| \neq 0, 0 \leq \theta, \gamma_c \leq 1$, and $\gamma_c + \gamma_s \leq 1$. An individual considers choosing the amount of the bequest to the child and spouse to maximize the utility function, given as:

$$\begin{aligned} U(b_c, b_s) = Log\big(y_i + h_p + h_{sp} - b_c - b_s\big) \\ + \beta_c \times Log\big(b_c - \theta \times h_p - \gamma_c \times h_{sp}\big) \\ + \beta_s \times Log\big(b_s - \gamma_s \times h_{sp}\big); \end{aligned}$$

then, the utility $U(b_c, b_s)$ will reach its maximum (see proof in Appendix 4-1C) when

$$\begin{aligned} b_c^* &= \frac{y_i\beta_c}{1+\beta_c+\beta_s} + \frac{h_p(\theta+\beta_c+\theta\beta_s)}{1+\beta_c+\beta_s} + \frac{h_{\mathrm{sp}}((1+\beta_s)\gamma_c+\beta_c(1-\gamma_s))}{1+\beta_c+\beta_s} \\ b_s^* &= \frac{y_i\beta_s}{1+\beta_c+\beta_s} + \frac{h_p(1-\theta)\beta_s}{1+\beta_c+\beta_s} + \frac{h_{\mathrm{sp}}((1+\beta_c)\gamma_s+\beta_s(1-\gamma_c))}{1+\beta_c+\beta_s} \end{aligned}$$

If the inheritance from the respondent's parents increases by Δ, the bequest to the child and spouse increases respectively by

$$b^*_{c,h_p+\Delta} - b_c^* = \frac{\theta+\beta_c+\theta\beta_s}{1+\beta_c+\beta_s}\Delta \quad (4\text{-}1)$$

$$b^*_{s,h_p+\Delta} - b_s^* = \frac{(1-\theta)\beta_s}{1+\beta_c+\beta_s}\Delta \quad (4\text{-}2)$$

If the inheritance from the spouse's parents increases by Δ, the bequest to the child and spouse increases respectively by

$$b^*_{c,h_{sp}+\Delta} - b_c^* = \frac{(1+\beta_s)\gamma_c+\beta_c(1-\gamma_s)}{1+\beta_c+\beta_s}\Delta \quad (4\text{-}3)$$

$$b^*_{s,h_{sp}+\Delta} - b_s^* = \frac{\beta_s(1-\gamma_c)+(1+\beta_c)\gamma_s}{1+\beta_c+\beta_s}\Delta \quad (4\text{-}4)$$

The differences in the increase in the bequests with respect to the difference in the source of inheritance are

$$\left[b^*_{c,h_p+\Delta} - b^*_c\right] - \left[b^*_{c,h_{sp}+\Delta} - b^*_c\right] = \frac{(1+\beta_s)(\theta-\gamma_c)+\beta_c\gamma_s}{1+\beta_c+\beta_s}\Delta \quad (4\text{-}5)$$

$$\left[b^*_{s,h_p+\Delta} - b^*_s\right] - \left[b^*_{s,h_{sp}+\Delta} - b^*_s\right] = \frac{-\beta_s(\theta-\gamma_c)-(1+\beta_c)\gamma_s}{1+\beta_c+\beta_s}\Delta \quad (4\text{-}6)$$

Proposition 1a. In the pure CBFT model, where $\beta_c, \beta_s > 0,\ 0 < \gamma_s \leq 1,\ |\theta| + |\gamma_c| \neq 0, 0 \leq \theta, \gamma_c \leq 1,\ \gamma_c + \gamma_s \leq 1$, and the inheritance from the individuals' parents and from their spouse's parents increases by the same amount Δ, *ceteris paribus*, the difference in the increase in the bequest to the child with respect to the source of inheritance (equation (4-5)) is larger than zero when $(\gamma_c - \theta) < \frac{\beta_c\gamma_s}{1+\beta_s}$; equals zero when $(\gamma_c - \theta) = \frac{\beta_c\gamma_s}{1+\beta_s}$; and is less than zero when $(\gamma_c - \theta) > \frac{\beta_c\gamma_s}{1+\beta_s}$.

Proposition 1b. In the pure CBFT model, where $\beta_c, \beta_s > 0,\ 0 < \gamma_s \leq 1,\ |\theta| + |\gamma_c| \neq 0, 0 \leq \theta, \gamma_c \leq 1,\ \gamma_c + \gamma_s \leq 1$, and the inheritance from the individuals' parents and from their spouse's parents increases by the same amount Δ, *ceteris paribus*, the differences in the increase in the bequest to the spouse with respect to the source of the inheritance (equation (4-6)) is larger than zero when $(\gamma_c - \theta) > \frac{(1+\beta_c)\gamma_s}{\beta_s}$; equals zero when $(\gamma_c - \theta) = \frac{(1+\beta_c)\gamma_s}{\beta_s}$; and is less than zero when $(\gamma_c - \theta) < \frac{(1+\beta_c)\gamma_s}{\beta_s}$.

Only when $\gamma_c = \theta$ and $\gamma_s = 0$ do both equations (4-5) and (4-6) equal zero, and the source of the inheritance does not affect the individual's bequests to either the child or the spouse. However, in this case, this becomes a mixed model, a CBFT to the child and a joy of giving to the spouse, rather than a pure CBFT model that assumes that the γ_s is larger than zero. For simplicity, this mixed type of model is not considered. Hence, in the case of the pure CBFT, the increase in the bequest to the child or the spouse varies according to the source of the inheritance.

4.4. Data and Sample Selection

Data from the Preference Parameters Study (PPS) of Osaka University are used as the basis of the analysis in this study. This panel survey, which employs two-stage stratified random sampling,

has been conducted in Japan since 2003. In the first stage, all the cities are placed into 10 regions: Hokkaido, Tohoku, Kanto, Koshinetsu, Hokuriku, Tokai, Kinki, Chugoku, Shikoku, and Kyushu. In the second stage, in each region, the cities are categorized into four types according to size, ordinance designation, population of 100000 or more, population less than 100000, and towns and villages. In total, there are 40 strata. In each stratum, men and women aged 20–69 years are drawn from the population.

The data used in this study are from wave 2009, which includes two predominant variables concerning respondents' BA toward children and spouses: "I want to leave my children as much of my inheritance as possible" (hereafter "TO_CHILD") and "I want to leave my spouse as much of my inheritance as possible" (hereafter "TO_SPOUSE"). The wave 2009 was conducted from February to March of 2009 with fresh samples selected and added.

There are 6,181 observations in the wave 2009. Excluding those who did not answer the BA question, there are 6,060 observations. Since this study focuses on the respondent's BA toward children and spouse, the sample is restricted to those who are married (those who report that "I have a spouse [husband or wife, including common-law marriage]" in the survey) and have at least one child. We then had 4,466 observations. Excluding the observations with missing values, we were left with 3,634 observations overall.

4.5. The Empirical Framework

4.5.1. Methodology

The BA is captured as an ordered response. Hence, this study uses the ordered response model. The latent BA will be estimated as follows:

$$BA_i^* = \boldsymbol{X_i\beta} + \varepsilon$$

where BA applies TO_CHILD and TO_SPOUSE. Let $\boldsymbol{X}$ denote a vector of socio-economics characteristics, $\boldsymbol{\beta}$ denote a $K \times 1$ vector of parameters, and ε denote the error term.

Let ω_j be the thresholds, where $j = 1,2,3,4$. Define the values of *BA* as follows:

$$
\begin{aligned}
BA = 1 \quad & if \quad BA^* \leq \omega_1 \\
BA = 2 \quad & if \quad \omega_1 < BA^* \leq \omega_2 \\
BA = 3 \quad & if \quad \omega_2 < BA^* \leq \omega_3 \\
BA = 4 \quad & if \quad \omega_3 < BA^* \leq \omega_4 \\
BA = 5 \quad & if \quad BA^* > \omega_4
\end{aligned}
$$

The generalized ordered logit model (Williams, 2006) is written as

$$
P(BA_i > j) \quad = \quad P_{ij} \quad = \quad \frac{\exp\left(\alpha_j + X_i\beta_j\right)}{1 + \exp\left(\alpha_j + X_i\beta_j\right)}, \qquad j = 1,2,3,4
$$

When all the coefficients β_j are identical across j ($\beta_j = \beta$), the model is the ordered logit model, which satisfies the parallel regression assumption (Wooldridge, 2010); when some but not all coefficients are identical across j, the model is the partial proportional odds model (Williams, 2006, 2016) as follows:

$$
P(BA_i > j) \quad = \quad P_{ij} \quad = \quad \frac{\exp\left(\alpha_j + \sum_{k=1}^{t-1} X_{k,i} \times \beta_k + \sum_{k=t}^{K} X_{k,i} \times \beta_{k,j}\right)}{1 + \exp\left(\alpha_j + \sum_{k=1}^{t-1} X_{k,i} \times \beta_k + \sum_{k=t}^{K} X_{k,i} \times \beta_{k,j}\right)}, \qquad j = 1,2,3,4
$$

where β_k is identical for $X_{k,i}$ $(k = 1,2, \dots t-1)$, and $\beta_{k,j}$ for $X_{k,i}$ $(k = t, \dots K)$ can differ across j.

4.5.2. Dependent Variables

The survey questions concerning BA are "I want to leave my children as much of my inheritance as possible" (TO_CHILD) and "I want to leave my spouse as much of my inheritance as possible" (TO_SPOUSE), measured on a five-point Likert scale and coded as 1, "Doesn't hold true at all for me" and 5, "Particularly true for me."[30]

Table 4-1 shows the cross table for those who answered both questions. About 43% and 42% of the respondents chose "3" for "TO_CHILD" and "TO_SPOUSE," respectively. Among Japanese women, 28% chose "4" or "5" for "TO_CHILD," while 31% of Japanese men followed suit. Only 16% of Japanese women chose "4" or "5" for "TO_SPOUSE," while 43% of the Japanese men chose those rankings. Japanese women were inclined to choose a lower triangular

[30] The original coding in the questionnaire is 1, "Particularly true for me" and 5, "Doesn't hold true at all for me."

portion, while Japanese men were inclined to choose an upper triangular portion, indicating that Japanese women were more likely to leave as much inheritance as possible to their children rather than to their spouses, while Japanese men were more likely to leave as much as possible to their spouses than to their children.

Table 4-1 Here

4.5.3. Independent Variables

The predominant independent variable used in this study is "Have you received any inheritance (or transfers of wealth before death) from your parents or your spouse's parents in the past?" The variable equals 1 if the respondent has received transfers from his/her own parents (spouse's parents) and 0 if he/she has not. This question captured the source of inheritance.[31] If the respondent has received an inheritance from his/her own parents (INH_P), the BA toward children would be expected to be positive. If the respondent has received an inheritance from the spouse's parents (INH_SP), the BA toward the spouse (and children) would be expected to be positive.

The survey also contains a question about whether the respondent expects to receive any wealth transfers, that is, "Do you expect that you will receive any inheritance (or transfers of wealth before death) from your parents or your spouse's parents in the future?" This variable is controlled in the regression separately as a dummy for expecting to receive an inheritance from parents (EXPINH_P) and from spouse's parents (EXPINH_SP). The expectation to receive wealth transfers does not increase the respondent's wealth. Thus, this seems less likely to open a new mental account for each source of expected transfers. However, considering the attribution of the fairness intention (Falk et al., 2003) and empirical results from previous literature, the signs of expected inheritance dummies are predicted as positive.

[31] Due to data limitations, it is hard to say if the money transfer is from inheritance or inter vivos wealth transfer. For simplicity, this variable is regarded as the source of inheritance here. In section 4.6.3, the information about parents' survival is used to separate inheritance from inter vivos transfers.

Other independent variables include socio-economic characteristics such as a female dummy, household income, number of children in the family, faith in religion, life expectancy and its square, and educational attainment. The sign of the female dummy is expected to be negative in terms of BA since previous literature finds the female dummy negatively correlated with the expectation of bequeathing.

The question "Approximately how much was the annual earned income before taxes and with bonuses included for your entire household for 2008?" is used to estimate annual household income; the answers are reported in 12 categories. This study uses the mid-point of each income category and assigns a value of half of the upper bound for the lowest category (500,000 JPY) and 1.5 times the lower bound for the highest category (30,000,000 JPY). The household income is taken as a natural logarithm in the analysis. The sign is expected to be positively correlated with BA. The sign of the number of children in the family is expected to be negative. The more children the respondent has, the more support needed, and the less ability to save for intentional bequests, given the budget constraint.

Faith in religion is captured by the statement that "I am deeply religious," which is measured on a five-point Likert scale and coded as 1, "Doesn't hold true at all for me" and 5, "Particularly true for me." The sign is expected to be positive.[32]

The reason this study uses life expectancy rather than respondent's age is that women outlive men, in general. Data for 2005 to 2009 show that the five-year average effective ages of retirement for men and women are 69.5 and 66.7 years, respectively.[33] Life expectancy at 70 years old for men and 67 years old for women was 15.10 and 22.21 years in 2009, respectively.[34] Thus, the length of retirement for women is much longer than for men. Since women have to prepare for a

[32] The original coding in the questionnaire is 1, "Particularly true for me" and 5, "Doesn't hold true at all for me."

[33] The data were downloaded from the OECD "Ageing and Employment Policies - Statistics on average effective age of retirement" from http://www.oecd.org/els/emp/average-effective-age-of-retirement.htm, retrieved on September 19, 2018.

[34] The Japanese data were obtained from the Ministry of Health, Labour, and Welfare, retrieved on September 13, 2018.

longer retirement than men do, it is plausible to use life expectancy at each age in the analysis. The sign of life expectancy and its square are difficult to anticipate. Those who have longer life expectancy may have optimistic bequest plans, and can achieve their goal of leaving as much as possible by saving more and/or working harder. Those who have shorter life expectancy may also have a higher BA since they have tried to do their best to leave adequate bequests.

Educational attainment is categorized into three groups; those who did not finish high school, those who graduated from high school but not from college, and those who graduated from college or higher. Well-educated respondents may care more about children and spouse utilities. Therefore, the sign will be positive if the respondent has higher educational attainment. However, if well-educated respondents are more likely to invest in children's human capital, the trade-off between human capital transfer now and bequeathing later may lead the sign to TO_CHILD to be negative.

Table 4-2 presents the summary statistics of the dependent and independent variables (and respondent's age for reference) in the regression. The means of TO_CHILD and TO_SPOUSE are 2.99 and 2.94, respectively, and the difference is significant at the 1% level. Of the respondents, 24% and 16% reported inheritance from their own parents and spouse's parents, respectively. The corresponding expectations of inheritance were 33% and 25%. Table 4-3 presents the means of each variable across different levels of BA. Apparently, the means of the FEMALE dummy decrease with the increase in BA on TO_SPOUSE, and the means of LIFEEXP increase with the increase in BA on TO_CHILD.

Table 4-2 Here

Table 4-3 Here

4.6. Empirical Results

In the analysis, the predominant independent variables are simply inheritance received/expected in total. In the robustness check, the information about parent survival is used to identify whether the bequest is from inheritance or inter vivos transfer.

4.6.1. Partial Proportional Odds Model

This study uses the partial proportional odds model (PPO) because the Brant test shows that some variables violate the parallel regression assumption in the ordered logistic regression.[35] Table 4-4 presents the estimated results of the PPO for TO_CHILD and TO_SPOUSE. The panel J shows the result when the dependent variable BA equals 1 through J compared with BA equals $J+1$ through 5.

Table 4-4 Here

Concerning TO_CHILD, the positive sign of the constrained variables, INH_P, INH_SP, and EXPINH_P, suggests that those who have received an inheritance from their own parents and their spouse's parents, and expect to receive an inheritance from their own parents are more likely to agree to leaving as much bequest as possible to their children. Females and families with many children tend to be less supportive, while rich families and those who have finished high school have more supportive BAs toward children. The positive sign in Panel 2 and the negative sign in Panel 3 of FAITH indicate that pious people are more likely to choose $\mathrm{BA} = 3,4,5$ over $\mathrm{BA} = 1,2$, but are less likely to choose $\mathrm{BA} = 4,5$ over $\mathrm{BA} = 1,2,3$. The positive sign in Panel 2 of LIFEEXP suggests that the longer life expectancy is, the more likely the respondent is to choose $\mathrm{BA} = 3,4,5$ over $\mathrm{BA} = 1,2$. The positive signs in Panel 2 and 3 for squared LIFEEXP suggest that the longer life expectancy is, the stronger the effect of having a higher BA. Less-educated respondents (NOHIGH) are more likely to choose the highest level, BA=5.

[35] This study uses the Stata program from Williams (2006) and autofit uses the .05 level of significance by default.

Concerning TO_SPOUSE, the positive sign of the constrained variables INH_SP and EXPINH_P suggests that those who have received an inheritance from their spouse's parents, and expect to receive an inheritance from their own parents are more likely to agree with leaving as much bequest as possible to their spouse. The constrained variables HHINC and CHILDNUM, and the variables violating the parallel regression assumption, FAITH, LIFEEXP and its squared term, and NOHIGH show similar effects on TO_CHILD. The negative signs of FEMALE over four panels suggest that females are more likely to choose lower BAs over higher BAs than males; specifically, females tend to choose the lowest level, BA=1.

Table 4-5 Here

To examine how the predicted probabilities of BA change as the independent variable changes, Table 4-5 presents the marginal effects at the means reported by the PPO for different levels of BA. The TO_CHILD panel shows that the probability of a higher BA is greater when INH_P, INH_SP, and EXPINH_P equal one, among those who have higher household income, longer life expectancy, and lower educational attainment. The probability of a lower BA is greater when the respondents are female and have a larger number of children. The TO_SPOUSE panel shows similar results as the TO_CHILD panel; there is a greater probability of a higher BA when INH_SP and EXPINH_P equal one, among those who have higher household income, and longer life expectancy. There is a greater probability of a lower BA when the respondents are female and have a larger number of children.

In sum, those who have an inheritance from their own parents are more likely to leave as much bequest as possible to their children. Those who have an inheritance from their spouse's parents are more likely to leave as much bequest as possible to both their children and spouse.

4.6.2. Gender Comparison

Applying the same empirical framework as in the previous subsections, gender differences associated with the source of inheritance are considered by analyzing the subsamples. Table 4-2

presents the summary statistics separately for Japanese females and males. P-values summarized with asterisks represent the mean differences between females and males for each variable. The BA toward children and spouses is much higher among male respondents than female. More males have received/expect an inheritance from their own parents than females, while more females have received/expect an inheritance from their spouse's parents. This implies that a son's family is more likely to (expect to) receive wealth transfer than a daughter's family, which is consistent with other study results (Niimi and Horioka, 2018).

There are no significant gender differences in terms of household income, number of children, and religious faith. Male respondents in the sample are older than their female counterparts, and male corresponding life expectancy is much lower than that of a female. Concerning educational attainment, more males graduated from college or higher than females.

Table 4-6 Here

Table 4-7 Here

Table 4-6 presents the estimated results of the PPO for females and males, using the same default setting as Table 4-4. For brevity, the table only shows the variables, INH_P, INH_SP, EXPINH_P, and EXPINH_SP, which are constrained over all panels (full specifications are presented in Appendix 4-2). Table 4-7 shows the corresponding marginal effects (full specifications are presented in Appendix 4-3). Those results suggest that females who have received INH_P are more likely to have a higher BA rather than a lower BA TO_CHILD, and those who have received INH_SP are more likely to have a higher BA rather than a lower BA both TO_CHILD and TO_SPOUSE. The results suggest that males who have received INH_P are more likely to have higher BAs rather than lower BAs TO_CHILD, and those who have received INH_SP are less likely to have lower BAs TO_SPOUSE.

4.6.3. Inheritance and Inter Vivos Transfers

One of our data limitations is that we cannot identify whether INH_P, INH_SP, EXPINH_P, and EXPINH_SP as inheritance or inter vivos transfers. For a robustness check, we use parent survival information to classify each of the four variables into three categories: inter vivos transfer, inheritance from either mother or father or both, and nothing (Table 4-8). The assumptions are that if both parents are alive, money transfers are probably inter vivos transfers (defined as "TRANS_PR" from the respondent's parents and "TRANS_SPR" from the spouse's parents); if one or both of the parents are deceased, the money transfers are probably inheritance (defined as "INH_PR" from the respondent's parents and "INH_SPR" from the spouse's parents). In terms of the expectation of money transfers, suppose that respondents expect to receive inter vivos transfers first (defined as "EXPTRANS_PR" from the respondent's parents and "EXPTRANS_SPR" from spouse's parents) when both parents are alive; once one of the parents die, the respondents expect to receive an inheritance (defined as "EXPINH_PR" from respondent's parents and "EXPINH_SPR" from spouse's parents).

Table 4-8 Here

Two hypothetical questions concerning altruism toward children and reciprocity toward parents are included, captured by "For the purpose of this question, please assume that you have a child and that your child does not live with you. Suppose that your child had only one-third as much family income per person to live on as you do. How much of your own family income per month would you be willing to give to your child to help out until things changed (possibly a few years)?" (hereafter "GIVE_C"); and, "For the purpose of this question, please assume that your parents are both living and that you do not live with them. Suppose that your parents had only one-third as much family income per person to live on as you do. How much of your own family income per month would you be willing to give to your parents to help them out until things changed (possibly

a few years)?" (hereafter "GIVE_P").[36] The more the respondents were willing to give to help their children, the more altruistic they were considered to be toward children, predicted to be positively associated with a higher BA. The GIVE_P was used to capture the level of reciprocity as parents raised the respondents and GIVE_P captured how much the respondents were willing to help out if their parents were in worse financial situations; the higher the amount given to help their parents, the more reciprocal they were considered to be. Supposing that the reciprocity level toward spouse corresponded with the reciprocity level toward parents, therefore, a higher level GIVE_P is predicted to be positively associated with a higher level BA TO_SPOUSE.

Table 4-9 presents the marginal effects of the means reported by the PPO for different levels of BA controlling the other socio-economic characteristics listed (summary statistics and full specifications are presented in Appendix 4-4 and Appendix 4-5, respectively). The results confirm the evidence that those who received INH_PR tend to have higher BAs TO_CHILD, and those who have received INH_SPR tend to have higher BAs TO_CHILD and TO_SPOUSE. EXPTRANS_PR and EXPINH_PR show that those who expect to receive money transfers, regardless of inheritance or inter vivos transfers, tend to have higher BAs TO_CHILD.

Table 4-9 Here

The probability of the lowest level BA=1 TO_CHILD increases from 0.0474 to 0.1106 percentage points, while the probability of higher levels TO_CHILD increase from 0.0562 to 0.1522 (BA=4) and from 0.0149 to 0.0395 (BA=5) percentage points when the level of GIVE_C rises. This suggests that the more altruistic the respondents are toward their children, the higher the BA TO_CHILD will be. Interestingly, the probability of lower BA levels TO_SPOUSE decrease from 0.0421 to 0.0384 (BA=1) and from 0.0608 to 0.0546 (BA=2) percentage points, while the probability of higher BAs TO_SPOUSE decreases from 0.0684 to 0.0604 (BA=4) and from 0.0139 to 0.0121 (BA=5) percentage points when the level of GIVE_C rises. This suggests

[36] Available choices were coded as "1. No help at all; 2. Up to 2% of your family income per month; 3. Up to 5% of your family income per month; 4. Up to 10% of your family income per month; 5. Up to 20% of your family income per month."

that the more altruistic the respondents are toward children, the higher the BAs TO_SPOUSE will be; but the probability of lower BAs increases and higher BAs decreases. The probability of higher BAs TO_SPOUSE is higher for GIVE_P, which suggests that those who are reciprocal are more likely to have higher BAs TO_SPOUSE.

4.6.4. Empirical Results Summary

In the empirical analysis of the full sample and the female subsample, the positive significant effect of INH_P on TO_CHILD and positive significant effects of INH_SP on TO_CHILD and TO_SPOUSE indicate that those who have received an inheritance from their parents are more likely to intend to leave as much as possible to their children, and those who have received an inheritance from their spouse's parents are more likely to intend to leave as much as possible to both their children and their spouse.

For the male subsample, the positive significant effect of INH_P on TO_CHILD and some significant effects of INH_SP on TO_SPOUSE indicate that those who have received an inheritance from their parents are more likely to intend to leave as much as possible to their children, and those who have received an inheritance from their spouse's parents are less likely to disagree to leave as much of bequest as possible

4.7. Empirical Result: Pure CBFT Model

There are two ways to interpret the insignificant coefficients of the empirical results. One is that the increase in an inheritance leads to a zero increase in bequests. The other is that the increase in an inheritance leads to a tiny increase in bequests, but is too small to be significant in terms of BA. In other words, the insignificant signs of INH_P and INH_SP on BA do not imply that an individual intends to leave nothing.

4.7.1. No Increase in Bequests

The insignificant effects of INH_P on TO_SPOUSE in the full sample, the female, and the male subsamples imply that equation (4-2) equals zero. As it is assumed that $\beta_s, \beta_c > 0$ in the pure CBFT model, $\theta = 1$ in this case, which means that the weight assigned to the child in the P-R-C community equals one. This suggests that once an individual has received an inheritance from his/her own parents, he/she will pass the full amount of the transfer to his/her child in terms of a bequest ($b^*_{c,h_p+\Delta} - b^*_c = \Delta$ in equation (4-1)).

The insignificant effect of INH_SP on TO_CHILD in the male subsample implies that equation (4-3) equals zero. We assume that $\beta_c, \beta_s > 0$, $0 < \gamma_s \leq 1, 0 \leq \gamma_c \leq 1$, and $\gamma_c + \gamma_s \leq 1$ in the pure CBFT model, in this case, $\gamma_c = 0$ and $\gamma_s = 1$, which implies that the weight assigned to the child in the SP-S-C community equals zero and the weight assigned to the spouse in the SP-S-C community equals one. This suggests that once a Japanese male has received an inheritance from a spouse's parents, he will pass the full amount of the transfer on to his spouse in terms of a bequest ($b^*_{s,h_{sp}+\Delta} - b^*_s = \Delta$ in equation (4-4)). The pure CBFT model is sufficient to explain the empirical results.

4.7.2. Small Increase in Bequests

In this case, the insignificant effects of the inheritance on BA do not imply that the respondents intend to leave no bequest. Significant coefficients represent more bequest than insignificant coefficients. The empirical results are interpreted in horizontal and vertical comparisons.

In the horizontal comparison, both the effects of INH_P on TO_CHILD and TO_SPOUSE, and INH_SP on TO_CHILD and TO_SPOUSE, the differences between the bequests to child and to spouse with respect to the source of inheritance, are compared:

$$\left[b^*_{c,h_p+\Delta} - b^*_c\right] - \left[b^*_{s,h_p+\Delta} - b^*_s\right] = \frac{\theta + \beta_c + (2\theta - 1)\beta_s}{1 + \beta_c + \beta_s}\Delta \quad (4\text{-}7)$$

$$\left[b^*_{c,h_{sp}+\Delta} - b^*_c\right] - \left[b^*_{s,h_{sp}+\Delta} - b^*_s\right] = \frac{\gamma_c - \gamma_s + \beta_s(2\gamma_c - 1) + \beta_c(1 - 2\gamma_s)}{1 + \beta_c + \beta_s}\Delta \quad (4\text{-}8)$$

Proposition 2a. In the pure CBFT model, where $\beta_c, \beta_s > 0,\ 0 < \gamma_s \leq 1,\ |\theta| + |\gamma_c| \neq 0, 0 \leq \theta, \gamma_c \leq 1,\ \gamma_c + \gamma_s \leq 1$, and the inheritance from one's own parents increases by Δ, ceteris paribus, the difference between the increase in bequest to child and to spouse (equation (4-7)) is larger than zero when $\theta > \frac{\beta_s - \beta_c}{1+2\beta_s}$; equals zero when $\theta = \frac{\beta_s - \beta_c}{1+2\beta_s}$; and is less than zero when $\theta < \frac{\beta_s - \beta_c}{1+2\beta_s}$.

Proposition 2b. In the pure CBFT model, where $\beta_c, \beta_s > 0,\ 0 < \gamma_s \leq 1,\ |\theta| + |\gamma_c| \neq 0, 0 \leq \theta, \gamma_c \leq 1,\ \gamma_c + \gamma_s \leq 1$, and the inheritance from one's spouse's parents increases by Δ, ceteris paribus, the difference between the increase in bequest to child and to spouse (equation (4-8)) is larger than zero when $\gamma_c > \frac{(1+2\beta_c)\gamma_s + \beta_s - \beta_c}{1+2\beta_s}$; equals zero when $\gamma_c = \frac{(1+2\beta_c)\gamma_s + \beta_s - \beta_c}{1+2\beta_s}$; and is less than zero when $\gamma_c < \frac{(1+2\beta_c)\gamma_s + \beta_s - \beta_c}{1+2\beta_s}$.

The significant effects of INH_P on TO_CHILD and the insignificant effect of INH_P on TO_SPOUSE in the full sample, the female, and the male subsamples imply that equation (4-7) is larger than zero. In the pure CBFT model, $\theta > \frac{\beta_s - \beta_c}{1+2\beta_s}$, in this case.

The insignificant effect of INH_SP on TO_CHILD and some significant effects on TO_SPOUSE in the male subsample imply that equation (4-8) is less than zero. In the pure CBFT model, $\gamma_c < \frac{(1+2\beta_c)\gamma_s + \beta_s - \beta_c}{1+2\beta_s}$ in this case.

The vertical comparison assesses the effects of INH_P and INH_SP on TO_CHILD, and the effects of INH_P and INH_SP on TO_SPOUSE. The significant effect of INH_P on TO_CHILD and the insignificant effect of INH_SP on TO_CHILD in the male subsample imply that equation (4-5) is larger than zero. In the pure CBFT model, $(\gamma_c - \theta) < \frac{\beta_c \gamma_s}{1+\beta_s}$, in this case.

The insignificant effects of INH_P on TO_SPOUSE, and (some) significant effects of INH_SP on TO_SPOUSE in the full sample and the female (male) subsample imply that equation (4-6) is less than zero. In the pure CBFT model, $(\gamma_c - \theta) < \frac{(1+\beta_c)\gamma_s}{\beta_s}$, in this case. The pure CBFT model is sufficient to explain the empirical results.

4.7.3. Gender analysis

The main differences in the gender comparison are the positive significant effects of INH_SP on TO_CHILD and on TO_SPOUSE in the female subsample, compared with the insignificant effect and some significant effects in the male subsample. Suppose the significant coefficients represent more bequest, under the pure CBFT model, this difference implies that $\left\{b^*_{c,h_{sp}+\Delta} - b^*_c\Big|_{female}\right\} > \left\{b^*_{c,h_{sp}+\Delta} - b^*_c\Big|_{male}\right\}$ and $\left\{b^*_{s,h_{sp}+\Delta} - b^*_s\Big|_{female}\right\} > \left\{b^*_{s,h_{sp}+\Delta} - b^*_s\Big|_{male}\right\}$.

Situation 1: Suppose $\beta_{cf} = \beta_{cm} = \beta_c$ and $\beta_{sf} = \beta_{sm} = \beta_s$

$$\begin{cases} \dfrac{(1+\beta_s)\gamma_{cf} + \beta_c(1-\gamma_{sf})}{1+\beta_c+\beta_s}\Delta - \dfrac{(1+\beta_s)\gamma_{cm} + \beta_c(1-\gamma_{sm})}{1+\beta_c+\beta_s}\Delta = \dfrac{(1+\beta_s)(\gamma_{cf}-\gamma_{cm}) - \beta_c(\gamma_{sf}-\gamma_{sm})}{1+\beta_c+\beta_s}\Delta > 0 \\ \dfrac{\beta_s(1-\gamma_{cf}) + (1+\beta_c)\gamma_{sf}}{1+\beta_c+\beta_s}\Delta - \dfrac{\beta_s(1-\gamma_{cm}) + (1+\beta_c)\gamma_{sm}}{1+\beta_c+\beta_s}\Delta = \dfrac{-\beta_s(\gamma_{cf}-\gamma_{cm}) + (1+\beta_c)(\gamma_{sf}-\gamma_{sm})}{1+\beta_c+\beta_s}\Delta > 0 \end{cases}$$

Then, it is equivalent to $\frac{\beta_c}{(1+\beta_s)}(\gamma_{sf} - \gamma_{sm}) < (\gamma_{cf} - \gamma_{cm}) < \frac{(1+\beta_c)}{\beta_s}(\gamma_{sf} - \gamma_{sm})$. Because $0 < \frac{\beta_c}{(1+\beta_s)} < \frac{(1+\beta_c)}{\beta_s}$, then, the necessary condition $\gamma_{sf} > \gamma_{sm}$ and $\gamma_{cf} > \gamma_{cm}$ implies that females care more about the weights assigned to the child and the spouse in the SP-S-C community than males do.

Situation 2: Suppose $\gamma_{cf} = \gamma_{cm} = \gamma_c$ and $\gamma_{sf} = \gamma_{sm} = \gamma_s$

$$\begin{cases} \dfrac{(1+\beta_{\mathrm{sf}})\gamma_c+\beta_{\mathrm{cf}}(1-\gamma_s)}{1+\beta_{\mathrm{cf}}+\beta_{\mathrm{sf}}}\Delta-\dfrac{(1+\beta_{\mathrm{sm}})\gamma_c+\beta_{\mathrm{cm}}(1-\gamma_s)}{1+\beta_{\mathrm{cm}}+\beta_{\mathrm{sm}}}\Delta & =\dfrac{(\beta_{\mathrm{cf}}(1+\beta_{\mathrm{sm}})-\beta_{\mathrm{cm}}(1+\beta_{\mathrm{sf}}))(1-\gamma_c-\gamma_s)}{(1+\beta_{\mathrm{cf}}+\beta_{\mathrm{sf}})(1+\beta_{\mathrm{cm}}+\beta_{\mathrm{sm}})}\Delta \\ & >0 \\ \dfrac{\beta_{\mathrm{sf}}(1-\gamma_c)+(1+\beta_{\mathrm{cf}})\gamma_s}{1+\beta_{\mathrm{cf}}+\beta_{\mathrm{sf}}}\Delta-\dfrac{\beta_{\mathrm{sm}}(1-\gamma_c)+(1+\beta_{\mathrm{cm}})\gamma_s}{1+\beta_{\mathrm{cm}}+\beta_{\mathrm{sm}}}\Delta & =\dfrac{(\beta_{\mathrm{sf}}(1+\beta_{\mathrm{cm}})-\beta_{\mathrm{sm}}(1+\beta_{\mathrm{cf}}))(1-\gamma_c-\gamma_s)}{(1+\beta_{\mathrm{cf}}+\beta_{\mathrm{sf}})(1+\beta_{\mathrm{cm}}+\beta_{\mathrm{sm}})}\Delta \\ & >0 \end{cases}$$

Because $1-\gamma_c-\gamma_s>0$, then, it is equivalent to $\frac{\beta_{cf}}{\beta_{cm}}>\frac{1+\beta_{sf}}{1+\beta_{sm}}$ and $\frac{\beta_{sf}}{\beta_{sm}}>\frac{1+\beta_{cf}}{1+\beta_{cm}}$. In this case, the necessary condition $\beta_{cf}>\beta_{cm}$ and $\beta_{sf}>\beta_{sm}$ (see proof in Appendix 4-1D) implies that females care more about family tradition to the child and spouse than males do.

Hence, to explain the gender differences, under the pure CBFT model, suppose $\beta_{cf}=\beta_{cm}=\beta_c$ and $\beta_{sf}=\beta_{sm}=\beta_s$, when $\gamma_{sf}>\gamma_{sm}$ and $\gamma_{cf}>\gamma_{cm}$; or suppose $\gamma_{cf}=\gamma_{cm}=\gamma_c$ and $\gamma_{sf}=\gamma_{sm}=\gamma_s$, when $\beta_{cf}>\beta_{cm}$ and $\beta_{sf}>\beta_{sm}$, the pure CBFT model is sufficient to explain the empirical results. This suggests that females are more likely to assign higher weights to the child and the spouse in the SP-S-C community or higher family tradition to the child and the spouse than males.

4.8. Conclusion and Discussion

This study examines the community-based indirect reciprocity in BAs involving three generations. The theoretical model, called community-based family tradition, extends the "family tradition" model proposed by Stark and Nicinska (2015) and includes community-based indirect reciprocity driven by the fairness consideration and mental accounting theory. The pure CBFT model suggests that the source of inheritance has a different impact on bequeathing.

The empirical analysis uses survey data from the wave 2009 PPS of Osaka University in Japan. The results from the PPO regression suggest that with some socio-economics characteristics controlled, those who have an inheritance from their own parents are more likely to plan to leave as much bequest as possible to their children, while those who have an inheritance from their spouse's parents are more likely to plan to leave as much bequest as possible to both their children

and their spouse. Hence, the source of the inheritance does affect the BA, which suggests that there is community-based indirect reciprocity in BA.

The empirical results show that once Japanese females have an inheritance from either their own parents or their spouse's parents, they intend to leave as much bequest as possible to their children; and once they have an inheritance from their spouse's parents, they intend to leave as much bequest as possible to their spouse. For Japanese males, once they have an inheritance from their own parents, they intend to leave as much bequest as possible to their children, while once they have an inheritance from their spouse's parents, the BA toward children is unaffected but it decreases the probability of a lower BA toward their spouse.

The gender differences in BA show that females pay more attention to the weights assigned or follow stronger family traditions to the child and the spouse than males do. Those results suggest that females are more likely to apply fairer consideration than males, which is consistent with the results from Andreoni and Vesterlund (2001). Since Stark and Nicinska (2015) argue that family tradition may moderate the effectiveness of the inheritance tax and the empirical result from Andreoni and Vesterlund (2001) indicates that females are less price-elastic than males, the empirical results from this study suggest that the taxation on inheritance is less functional for females than for males.

The results from this study must be considered with caution. First, the BAs are captured by asking if the respondents agree or disagree with the statement that they will leave as much of bequest as possible to their children and their spouse. Even when the empirical results are not significant, this does not mean that the individuals will leave nothing to their children and their spouses.

Second, although the empirical results do not violate the simplest pure CBFT model, the intention of bequeathing may be more complex. For example, for the full sample and female subsample, both INH_P and INH_SP have positive significant effects on TO_CHILD, which can be explained simply by either the altruistic model or the joy of giving model. In addition, the

results in section 4.6.3 indicate that altruism toward children has positive significant effects on TO_CHILD and TO_SPOUSE, and reciprocity toward parents has a positive significant effect on TO_SPOUSE. Therefore, further investigation into a general model that combines altruism (or the joy of giving) and the CBFT is required.

Third, data limitations preclude this study from further analysis on the amount of inheritance received and the amount of bequest intended. In addition, as mentioned, this study uses parents' survival information to identify if the wealth transfer is from an inheritance or from inter vivos transfers. This categorization may not be accurate. Therefore, further research on this is needed.

4.9. References

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Table 4-1 Bequest Attitudes toward Children and Spouse (%)

	All	TO_SPOUSE					
		Doesn't hold true	2	3	4	Particularly true	Total
TO_CHILD	Doesn't hold true	5.48	0.80	0.80	0.85	0.14	8.06
	2	1.82	12.36	3.05	2.67	0.17	20.06
	3	1.98	4.07	31.10	4.95	0.55	42.65
	4	0.55	1.73	5.97	14.25	0.44	22.95
	Particularly true	0.52	0.19	0.85	0.80	3.91	6.27
	Total	10.35	19.15	41.77	23.53	5.20	100.00
	Number of Observations						3,634

	Female	TO_SPOUSE					
		Doesn't hold true	2	3	4	Particularly true	Total
TO_CHILD	Doesn't hold true	7.14	0.42	0.53	0.53	0.00	8.62
	2	3.01	13.27	2.59	1.06	0.05	19.99
	3	3.23	6.45	32.31	1.59	0.11	43.68
	4	0.90	3.07	8.57	9.31	0.00	21.84
	Particularly true	0.90	0.32	1.32	1.00	2.33	5.87
	Total	15.18	23.53	45.32	13.48	2.49	100.00
	Number of Observations						1,891

	Male	TO_SPOUSE					
		Doesn't hold true	2	3	4	Particularly true	Total
TO_CHILD	Doesn't hold true	3.67	1.20	1.09	1.20	0.29	7.46
	2	0.52	11.36	3.56	4.42	0.29	20.14
	3	0.63	1.49	29.78	8.61	1.03	41.54
	4	0.17	0.29	3.16	19.62	0.92	24.15
	Particularly true	0.11	0.06	0.34	0.57	5.62	6.71
	Total	5.11	14.40	37.92	34.42	8.15	100.00
	Number of Observations						1,743

Table 4-2 Summary Statistics

		All		Female		Male		
Variable	Definition	Mean	S.D.	Mean	S.D.	Mean	S.D.	P-value
TO_CHILD	I want to leave my children as much of my inheritance as possible	2.99	1.00	2.96	1.00	3.03	1.00	*
TO_SPOUSE	I want to leave my spouse as much of my inheritance as possible	2.94	1.02	2.65	0.98	3.26	0.98	***
INH_P	Receive inheritance/transfers of wealth from parents	0.24	0.43	0.20	0.40	0.29	0.45	***
INH_SP	Receive inheritance/transfers of wealth from spouse's parents	0.16	0.37	0.20	0.40	0.12	0.33	***
EXPINH_P	Expect to receive inheritance/transfers of wealth from parents	0.33	0.47	0.28	0.45	0.39	0.49	***
EXPINH_SP	Expect to receive inheritance/transfers of wealth from spouse's parents	0.25	0.43	0.29	0.45	0.21	0.41	***
FEMALE	Female dummy	0.52	0.50	1.00	0.00	0.00	0.00	
HHINC	Log of household income	6.37	0.63	6.37	0.60	6.37	0.66	
CHILDNUM	Number of children	2.16	0.74	2.15	0.72	2.17	0.75	
FAITH	I am deeply religious	1.70	1.06	1.69	1.08	1.72	1.04	
AGE	Respondent's age	52.01	11.69	50.87	11.91	53.24	11.32	***
LIFEEXP	Life expectancy (in decades)	3.32	1.13	3.71	1.11	2.91	0.99	***
NOHIGH	Did not finish high school	0.10	0.31	0.09	0.29	0.12	0.32	***
HIGHSCH	Graduate from high school but not graduate from college	0.66	0.47	0.78	0.41	0.53	0.50	***
COLLEGE	Graduate from college or higher	0.24	0.42	0.13	0.33	0.35	0.48	***
Observations		3,634		1,891		1,743		

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 4-3 Means of the Variables by Bequest Attitude

	TO_CHILD					TO_SPOUSE				
Variable	1	2	3	4	5	1	2	3	4	5
INH_P	0.24	0.25	0.24	0.25	0.22	0.21	0.23	0.24	0.27	0.24
INH_SP	0.16	0.15	0.16	0.18	0.14	0.15	0.16	0.17	0.17	0.13
EXPINH_P	0.20	0.29	0.33	0.39	0.42	0.27	0.28	0.33	0.39	0.40
EXPINH_SP	0.20	0.21	0.24	0.31	0.29	0.23	0.25	0.25	0.27	0.25
FEMALE	0.56	0.52	0.53	0.50	0.49	0.76	0.64	0.56	0.30	0.25
HHINC	6.20	6.32	6.40	6.42	6.37	6.28	6.32	6.39	6.41	6.30
CHILDNUM	2.30	2.24	2.17	2.07	2.01	2.24	2.25	2.15	2.12	1.99
FAITH	1.73	1.69	1.77	1.62	1.56	1.67	1.65	1.76	1.67	1.63
AGE	55.52	54.37	52.40	49.50	46.46	52.40	53.01	52.07	51.79	48.02
LIFEEXP	3.03	3.11	3.29	3.54	3.82	3.43	3.31	3.34	3.22	3.53
NOHIGH	0.17	0.11	0.11	0.07	0.11	0.12	0.11	0.11	0.08	0.13
HIGHSCH	0.64	0.66	0.66	0.67	0.68	0.70	0.69	0.68	0.60	0.60
COLLEGE	0.19	0.23	0.24	0.26	0.22	0.18	0.20	0.22	0.32	0.28
Observations	293	729	1,550	834	228	376	696	1,518	855	189

Note: 1 “Doesn’t hold true at all for me” and 5 “Particularly true for me.”

Table 4-4 PPO results for TO_CHILD and TO_SPOUSE (Coefficients)

	TO_CHILD				TO_SPOUSE			
	Panel 1	Panel 2	Panel 3	Panel 4	Panel 1	Panel 2	Panel 3	Panel 4
INH_P	0.1681**	0.1681**	0.1681**	0.1681**	0.0370	0.0370	0.0370	0.0370
	(0.07)	(0.07)	(0.07)	(0.07)	(0.08)	(0.08)	(0.08)	(0.08)
INH_SP	0.2657***	0.2657***	0.2657***	0.2657***	0.3095***	0.3095***	0.3095***	0.3095***
	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)
EXPINH_P	0.2175***	0.2175***	0.2175***	0.2175***	0.1221*	0.1221*	0.1221*	0.1221*
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
EXPINH_SP	0.0680	0.0680	0.0680	0.0680	0.0920	0.0920	0.0920	0.0920
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
FEMALE	-0.4338***	-0.4338***	-0.4338***	-0.4338***	-1.3064***	-1.1187***	-1.5585***	-1.6803***
	(0.07)	(0.07)	(0.07)	(0.07)	(0.14)	(0.09)	(0.09)	(0.20)
HHINC	0.1859***	0.1859***	0.1859***	0.1859***	0.1405***	0.1405***	0.1405***	0.1405***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
CHILDNUM	-0.2343***	-0.2343***	-0.2343***	-0.2343***	-0.2040***	-0.2040***	-0.2040***	-0.2040***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
FAITH	0.0480	0.0776*	-0.0687*	-0.0743	0.0746	0.1121***	-0.0286	-0.0035
	(0.06)	(0.04)	(0.04)	(0.09)	(0.06)	(0.04)	(0.04)	(0.09)
LIFEEXP	0.4478	0.3433*	-0.2084	-0.3047	-0.0044	0.1151	-0.6948***	-0.5608
	(0.34)	(0.20)	(0.20)	(0.32)	(0.32)	(0.20)	(0.19)	(0.36)
LIFEEXP × LIFEEXP	-0.0223	-0.0018	0.0779***	0.1045**	0.0130	0.0042	0.1226***	0.1394***
	(0.05)	(0.03)	(0.03)	(0.04)	(0.04)	(0.03)	(0.03)	(0.05)
NOHIGH	-0.1208	0.1623	0.0568	0.5652**	-0.1118	-0.0259	-0.1372	0.5325**
	(0.19)	(0.14)	(0.15)	(0.24)	(0.20)	(0.14)	(0.15)	(0.24)
HIGHSCH	0.1630**	0.1630**	0.1630**	0.1630**	0.0410	0.0410	0.0410	0.0410
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
Constant	0.5050	-1.0193**	-1.8196***	-3.7842***	2.1387***	0.2906	0.0293	-2.8432***
	(0.61)	(0.45)	(0.45)	(0.67)	(0.61)	(0.45)	(0.44)	(0.73)
Observations	3634				3634			
Pseudo R^2	0.0263				0.0506			

* p < 0.1, ** p < 0.05, *** p < 0.01. Robust standard errors in parentheses.

Table 4-5 Marginal Effects for TO_CHILD and TO_SPOUSE

	BA=1	BA=2	BA=3	BA=4	BA=5
			TO_CHILD		
INH_P	-0.0109**	-0.0217**	-0.0006	0.0252**	0.0081**
	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)
INH_SP	-0.0166***	-0.0339***	-0.0032	0.0403***	0.0133***
	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)
EXPINH_P	-0.0142***	-0.0282***	-0.0005	0.0325***	0.0104***
	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)
EXPINH_SP	-0.0045	-0.0089	0.0001	0.0101	0.0032
	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)
FEMALE	0.0291***	0.0564***	-0.0012	-0.0640***	-0.0203***
	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)
HHINC	-0.0125***	-0.0243***	0.0008	0.0275***	0.0086***
	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)
CHILDNUM	0.0158***	0.0307***	-0.0010	-0.0346***	-0.0108***
	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)
FAITH	-0.0032	-0.0121*	0.0287***	-0.0099	-0.0034
	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)
LIFEEXP	-0.0202***	-0.0455***	0.0056	0.0420***	0.0180***
	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)
NOHIGH	0.0093	-0.0420*	0.0222	-0.0186	0.0292**
	(0.01)	(0.02)	(0.03)	(0.02)	(0.01)
HIGHSCH	-0.0111**	-0.0218**	0.0018	0.0241**	0.0070**
	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)
			TO_SPOUSE		
INH_P	-0.0030	-0.0045	0.0008	0.0054	0.0012
	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)
INH_SP	-0.0234***	-0.0364***	0.0016	0.0474***	0.0108***
	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)
EXPINH_P	-0.0099*	-0.0147*	0.0026	0.0181*	0.0039*
	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)
EXPINH_SP	-0.0074	-0.0110	0.0019	0.0136	0.0030
	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)
FEMALE	0.1090***	0.1133***	0.0573***	-0.2196***	-0.0600***
	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)
HHINC	-0.0116***	-0.0169***	0.0035*	0.0206***	0.0044***
	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)
CHILDNUM	0.0168***	0.0246***	-0.0050**	-0.0299***	-0.0064***
	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)
FAITH	-0.0061	-0.0166**	0.0279***	-0.0050	-0.0001
	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)
LIFEEXP	-0.0068	-0.0223***	0.0076	0.0099	0.0116***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)
NOHIGH	0.0098	-0.0044	0.0181	-0.0435*	0.0201*
	(0.02)	(0.02)	(0.03)	(0.02)	(0.01)
HIGHSCH	-0.0034	-0.0050	0.0010	0.0061	0.0012
	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)

* p < 0.1, ** p < 0.05, *** p < 0.01. Robust standard errors in parentheses.

Table 4-6 PPO Results for Females and Males (Coefficients)

	Female		Male	
	TO_CHILD	TO_SPOUSE	TO_CHILD	TO_SPOUSE
INH_P	0.2058*	-0.0065	0.1905*	0.1330
	(0.11)	(0.12)	(0.10)	(0.10)
INH_SP	0.2898***	0.3007***	0.1512	0.2257
	(0.11)	(0.12)	(0.15)	(0.14)
EXPINH_P	0.2429**	0.2320**	0.1763*	-0.0174
	(0.10)	(0.10)	(0.10)	(0.11)
EXPINH_SP	0.0966	0.1473	0.0748	0.0684
	(0.10)	(0.10)	(0.12)	(0.12)
Observations	1891	1891	1743	1743
Pseudo R^2	0.0256	0.0154	0.0300	0.0239

* p < 0.1, ** p < 0.05, *** p < 0.01. Robust standard errors in parentheses.

Table 4-7 Marginal Effects for Females and Males

	Female					Male				
	BA=1	BA=2	BA=3	BA=4	BA=5	BA=1	BA=2	BA=3	BA=4	BA=5
					TO_CHILD					
INH_P	-0.0140*	-0.0275*	0.0046*	0.0288*	0.0081*	-0.0125*	-0.0253*	-0.0014	0.0291*	0.0100*
	(0.01)	(0.01)	(0.00)	(0.02)	(0.00)	(0.01)	(0.01)	(0.00)	(0.02)	(0.01)
INH_SP	-0.0193***	-0.0385***	0.0051	0.0410**	0.0117**	-0.0098	-0.0200	-0.0015	0.0232	0.0081
	(0.01)	(0.01)	(0.00)	(0.02)	(0.01)	(0.01)	(0.02)	(0.00)	(0.02)	(0.01)
EXPINH_P	-0.0166**	-0.0326**	0.0058*	0.0339**	0.0095**	-0.0117*	-0.0236*	-0.0006	0.0268*	0.0091*
	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.01)	(0.00)	(0.02)	(0.01)
EXPINH_SP	-0.0068	-0.0131	0.0029	0.0133	0.0037	-0.0050	-0.0100	-0.0003	0.0114	0.0039
	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.02)	(0.00)	(0.02)	(0.01)
					TO_SPOUSE					
INH_P	0.0008	0.0007	-0.0009	-0.0006	-0.0001	-0.0066	-0.0148	-0.0104	0.0236	0.0083
	(0.02)	(0.01)	(0.02)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)	(0.02)	(0.01)
INH_SP	-0.0365***	-0.0348**	0.0379***	0.0287**	0.0047**	-0.0106*	-0.0245*	-0.0195	0.0398	0.0147
	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)
EXPINH_P	-0.0289**	-0.0266**	0.0305**	0.0215**	0.0035**	0.0009	0.0020	0.0013	-0.0031	-0.0011
	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)
EXPINH_SP	-0.0186	-0.0168	0.0198	0.0134	0.0022	-0.0034	-0.0077	-0.0053	0.0121	0.0042
	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors in parentheses.

Table 4-8 Inheritance and Inter Vivos Transfers

Received from my parents

	Father	Mother	Variable	Freq.	Percent
INH_P = 1					
1	Alive	Alive	TRANS_PR	59	1.95
2	Alive	Deceased	INH_PR	31	1.02
3	Deceased	Alive		270	8.92
4	Deceased	Deceased		372	12.29
INH_P = 0					
5	Not missing	Not missing	NONE_PR	2,296	75.83

Received from spouse's parents

	Father	Mother	Variable	Freq.	Percent
INH_SP = 1					
1	Alive	Alive	TRANS_SPR	43	1.42
2	Alive	Deceased	INH_SPR	26	0.86
3	Deceased	Alive		179	5.91
4	Deceased	Deceased		266	8.78
INH_SP = 0					
5	Not missing	Not missing	NONE_SPR	2,514	83.03

Expect to receive from my parents

	Father	Mother	Variable	Freq.	Percent
EXPINH_P = 1					
1	Alive	Alive	EXPTRANS_PR	616	20.34
2	Alive	Deceased	EXPINH_PR	78	2.58
3	Deceased	Alive		303	10.01
4	Deceased	Deceased		6	0.2
EXPINH_P = 0					
5	Not missing	Not missing	EXPNONE_PR	2,025	66.88

Expect to receive from spouse's parents

	Father	Mother	Variable	Freq.	Percent
EXPINH_SP = 1					
1	Alive	Alive	EXPTRANS_SPR	478	15.79
2	Alive	Deceased	EXPINH_SPR	66	2.18
3	Deceased	Alive		242	7.99
4	Deceased	Deceased		6	0.2
EXPINH_SP = 0					
5	Not missing	Not missing	EXPNONE_SPR	2,236	73.84

Note: For the fourth case of EXPINH_PR and EXPINH_SPR, those whose mother and father have been dead for more than three years are eliminated in the analysis.

Table 4-9 Marginal Effects for Inheritance and Inter Vivos Transfers

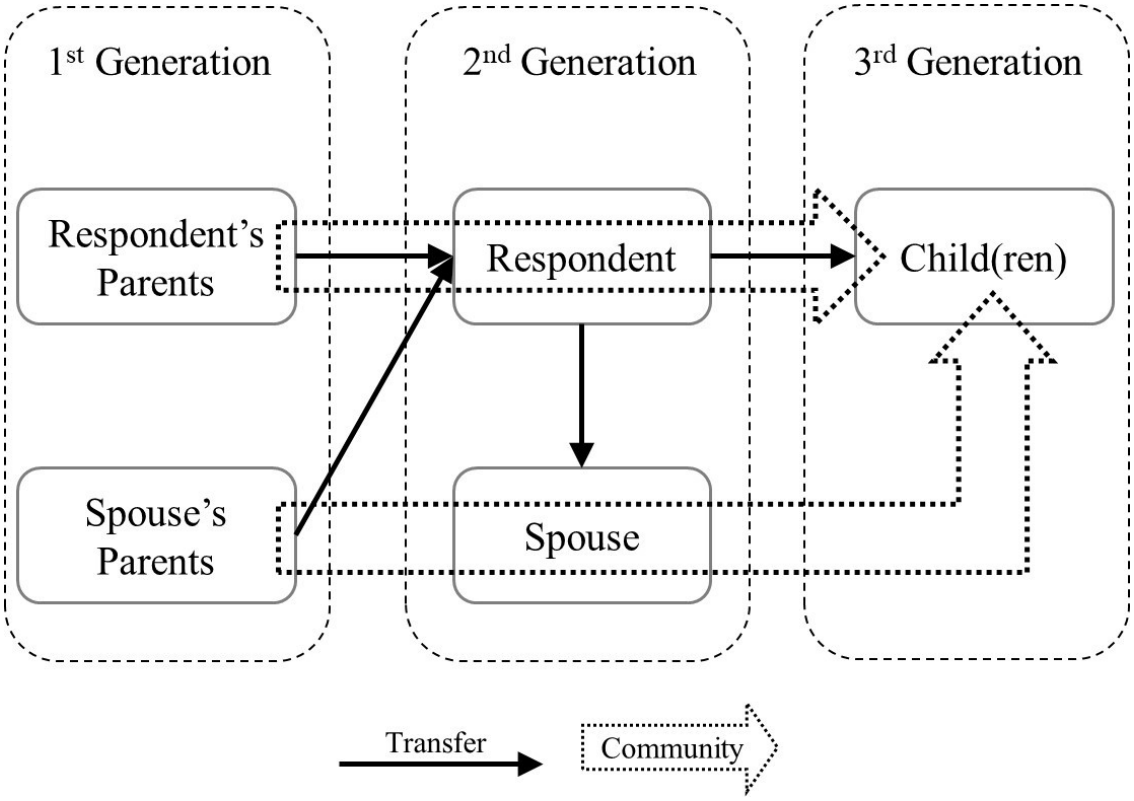
TO_CHILD	BA=1	BA=2	BA=3	BA=4	BA=5
TRANS_PR	0.0100	0.0197	-0.0027	-0.0205	-0.0065
	(0.02)	(0.04)	(0.01)	(0.04)	(0.01)
INH_PR	-0.0099*	-0.0213*	-0.0012	0.0241*	0.0083*
	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)
TRANS_SPR	-0.0163	-0.0359	-0.0037	0.0414	0.0146
	(0.01)	(0.03)	(0.01)	(0.04)	(0.02)
INH_SPR	-0.0190***	-0.0423***	-0.0059	0.0494***	0.0178***
	(0.01)	(0.01)	(0.00)	(0.02)	(0.01)
EXPTRANS_PR	-0.0140**	-0.0300**	-0.0015	0.0339**	0.0116**
	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)
EXPINH_PR	-0.0126*	-0.0267*	-0.0009	0.0299*	0.0102*
	(0.01)	(0.01)	(0.00)	(0.02)	(0.01)
EXPTRANS_SPR	-0.0061	-0.0130	-0.0004	0.0146	0.0050
	(0.01)	(0.01)	(0.00)	(0.02)	(0.01)
EXPINH_SPR	-0.0022	-0.0045	0.0000	0.0050	0.0017
	(0.01)	(0.02)	(0.00)	(0.02)	(0.01)
GIVE_C_2%	-0.0474***	-0.0540**	0.0304***	0.0562**	0.0149**
	(0.02)	(0.02)	(0.01)	(0.02)	(0.01)
GIVE_C_5%	-0.0597***	-0.0717***	0.0326***	0.0775***	0.0213***
	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)
GIVE_C_10%	-0.0722***	-0.0421**	-0.0159	0.0953***	0.0349***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)
GIVE_C_20%	-0.1106***	-0.0611**	-0.0201	0.1522***	0.0395***
	(0.02)	(0.02)	(0.03)	(0.02)	(0.01)
GIVE_P_2%	-0.0109	-0.0273	-0.0031	0.0310	0.0103
	(0.01)	(0.03)	(0.00)	(0.03)	(0.01)
GIVE_P_5%	0.0056	0.0129	-0.0009	-0.0135	-0.0041
	(0.01)	(0.02)	(0.00)	(0.03)	(0.01)
GIVE_P_10%	0.0008	0.0018	-0.0000	-0.0019	-0.0006
	(0.01)	(0.02)	(0.00)	(0.02)	(0.01)
GIVE_P_20%	0.0332*	-0.0550*	0.0089	-0.0094	0.0223
	(0.02)	(0.03)	(0.03)	(0.03)	(0.01)
Observations	3028				
Pseudo R^2	0.0344				

TO_SPOUSE	BA=1	BA=2	BA=3	BA=4	BA=5
TRANS_PR	0.0325	0.0456	-0.0184	-0.0499	-0.0099
	(0.03)	(0.04)	(0.02)	(0.04)	(0.01)
INH_PR	-0.0029	-0.0048	0.0005	0.0059	0.0013
	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)
TRANS_SPR	-0.0224	-0.0376	0.0002	0.0488	0.0110
	(0.02)	(0.03)	(0.01)	(0.04)	(0.01)
INH_SPR	-0.0283***	-0.0487***	-0.0036	0.0653***	0.0152***
	(0.01)	(0.01)	(0.01)	(0.02)	(0.00)
EXPTRANS_PR	-0.0084	-0.0146	0.0013	0.0178	0.0038
	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)
EXPINH_PR	0.0280	-0.0483**	0.0310	-0.0146	0.0039
	(0.02)	(0.02)	(0.03)	(0.02)	(0.01)
EXPTRANS_SPR	-0.0102	-0.0168	0.0012	0.0212	0.0046
	(0.01)	(0.01)	(0.00)	(0.02)	(0.00)
EXPINH_SPR	-0.0020	-0.0032	0.0005	0.0038	0.0008
	(0.01)	(0.01)	(0.00)	(0.02)	(0.00)
GIVE_C_2%	-0.0232	-0.0309	0.0157	0.0322	0.0062
	(0.02)	(0.02)	(0.01)	(0.02)	(0.00)
GIVE_C_5%	-0.0421***	-0.0608***	0.0206**	0.0684***	0.0139***
	(0.01)	(0.02)	(0.01)	(0.02)	(0.00)
GIVE_C_10%	-0.0405***	-0.0580***	0.0207**	0.0648***	0.0131***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)
GIVE_C_20%	-0.0384***	-0.0546***	0.0205**	0.0604***	0.0121***
	(0.01)	(0.02)	(0.01)	(0.02)	(0.00)
GIVE_P_2%	-0.0271*	-0.0416*	0.0094	0.0490*	0.0103*
	(0.01)	(0.02)	(0.01)	(0.03)	(0.01)
GIVE_P_5%	-0.0077	-0.0109	0.0044	0.0119	0.0023
	(0.01)	(0.02)	(0.01)	(0.02)	(0.00)
GIVE_P_10%	-0.0205	-0.0305	0.0089	0.0350*	0.0071*
	(0.01)	(0.02)	(0.01)	(0.02)	(0.00)
GIVE_P_20%	-0.0313**	-0.0488**	0.0088	0.0588**	0.0125**
	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)
Observations	3028				
Pseudo R^2	0.0590				

* p < 0.1, ** p < 0.05, *** p < 0.01. Robust standard errors in parentheses.

Note: The marginal effects at the means are reported by the PPO for different levels of BA with other socio-economic characteristics controlled such as female dummy, household income, number of children in the family, faith in religion, life expectancy and its square, and educational attainment.

Figure 4-1 Community identified by consanguineal kinship



4.10. Appendices

Appendix 4-1A

In the case of pure altruism, an individual chooses the amount of the bequest to child and spouse to maximize the utility function, given as:

$$U(b_c, b_s) = (1 - \alpha_c - \alpha_s) \times Log\left(y_i + h_p + h_{sp} - b_c - b_s\right) + \alpha_c \times Log(y_c + b_c) + \alpha_s \times Log(y_s + b_s)$$

Then,

$$\begin{aligned}
\frac{\partial U}{\partial b_c} &= \frac{\alpha_c}{b_c + y_c} - \frac{1 - \alpha_c - \alpha_s}{-b_c - b_s + h_p + h_{sp} + y_i} &= 0 \\
\frac{\partial^2 U}{\partial {b_c}^2} &= -\frac{\alpha_c}{(b_c + y_c)^2} - \frac{1 - \alpha_c - \alpha_s}{(-b_c - b_s + h_p + h_{sp} + y_i)^2} &< 0 \\
\frac{\partial U}{\partial b_s} &= \frac{\alpha_s}{b_s + y_s} - \frac{1 - \alpha_c - \alpha_s}{-b_c - b_s + h_p + h_{sp} + y_i} &= 0 \\
\frac{\partial^2 U}{\partial {b_s}^2} &= -\frac{1 - \alpha_c - \alpha_s}{(-b_c - b_s + h_p + h_{sp} + y_i)^2} - \frac{\alpha_s}{(b_s + y_s)^2} &< 0 \\
\frac{\partial^2 U}{\partial b_c \partial b_s} &= -\frac{1 - \alpha_c - \alpha_s}{(-b_c - b_s + h_p + h_{sp} + y_i)^2} & \\
\frac{\partial^2 U}{\partial {b_c}^2}\frac{\partial^2 U}{\partial {b_s}^2} - \left(\frac{\partial^2 U}{\partial b_c \partial b_s}\right)^2 &= \frac{\alpha_c \alpha_s}{(b_c + y_c)^2 (b_s + y_s)^2} & \\
&\quad + \frac{\alpha_c (1 - \alpha_c - \alpha_s)}{(b_c + y_c)^2 (-b_c - b_s + h_p + h_{sp} + y_i)^2} & \\
&\quad + \frac{\alpha_s (1 - \alpha_c - \alpha_s)}{(b_s + y_s)^2 (-b_c - b_s + h_p + h_{sp} + y_i)^2} &> 0
\end{aligned}$$

Because $\frac{\partial^2 U}{\partial {b_c}^2} < 0$ and $\frac{\partial^2 U}{\partial {b_s}^2} < 0$, $\frac{\partial^2 U}{\partial {b_c}^2}\frac{\partial^2 U}{\partial {b_s}^2} - \left(\frac{\partial^2 U}{\partial b_c \partial b_s}\right)^2 > 0$ for all b_c and b_s, then, the utility $U(b_c, b_s)$ will reach its maximum, when

$$\begin{aligned}
{b_c}^* &= -y_c + (h_p + h_{sp} + y_c + y_i + y_s)\alpha_c \\
{b_s}^* &= -y_s + (h_p + h_{sp} + y_c + y_i + y_s)\alpha_s
\end{aligned}$$

Appendix 4-1B

In the case of pure joy of giving, an individual chooses the amount of bequest to the child and spouse to maximize the utility function, given as:

$$U(b_c, b_s) = Log\left(y_i + h_p + h_{sp} - b_c - b_s\right) + \beta_c \times Log(b_c) + \beta_s \times Log(b_s)$$

Then,

$$\begin{aligned}
\frac{\partial U}{\partial b_c} &= -\frac{1}{-b_c - b_s + h_p + h_{\mathrm{sp}} + y_i} + \frac{\beta_c}{b_c} && = 0 \\
\frac{\partial^2 U}{\partial {b_c}^2} &= -\frac{1}{(-b_c - b_s + h_p + h_{\mathrm{sp}} + y_i)^2} - \frac{\beta_c}{b_c^2} && < 0 \\
\frac{\partial U}{\partial b_s} &= -\frac{1}{-b_c - b_s + h_p + h_{\mathrm{sp}} + y_i} + \frac{\beta_s}{b_s} && = 0 \\
\frac{\partial^2 U}{\partial {b_s}^2} &= -\frac{1}{(-b_c - b_s + h_p + h_{\mathrm{sp}} + y_i)^2} - \frac{\beta_s}{b_s^2} && < 0 \\
\frac{\partial^2 U}{\partial b_c \partial b_s} &= -\frac{1}{(-b_c - b_s + h_p + h_{\mathrm{sp}} + y_i)^2} && \\
\frac{\partial^2 U}{\partial {b_c}^2}\frac{\partial^2 U}{\partial {b_s}^2} - \left(\frac{\partial^2 U}{\partial b_c \partial b_s}\right)^2 &= \frac{1}{(-b_c - b_s + h_p + h_{\mathrm{sp}} + y_i)^2} \times \left(\frac{\beta_c}{b_c^2} + \frac{\beta_s}{b_s^2}\right) && \\
&\quad + \frac{\beta_c}{b_c^2} \times \frac{\beta_s}{b_s^2} && > 0
\end{aligned}$$

Because $\frac{\partial^2 U}{\partial {b_c}^2} < 0$ and $\frac{\partial^2 U}{\partial {b_s}^2} < 0$, $\frac{\partial^2 U}{\partial {b_c}^2}\frac{\partial^2 U}{\partial {b_s}^2} - \left(\frac{\partial^2 U}{\partial b_c \partial b_s}\right)^2 > 0$ for all b_c and b_s, then, the utility $U(b_c, b_s)$ will reach its maximum, when

$$\begin{aligned}
{b_c}^* &= \frac{(h_p + h_{\mathrm{sp}} + y_i)\beta_c}{1 + \beta_c + \beta_s} \\
{b_s}^* &= \frac{(h_p + h_{\mathrm{sp}} + y_i)\beta_s}{1 + \beta_c + \beta_s}
\end{aligned}$$

Appendix 4-1C

In the case of pure CBFT, an individual chooses the amount of bequest to the child and spouse to maximize the utility function, given as:

$$\begin{aligned} U(b_c, b_s) = Log\big(y_i + h_p + h_{sp} - b_c - b_s\big) \\ + \beta_c \times Log(b_c - \theta \times h_p - \gamma_c \times h_{sp}) \\ + \beta_s \times Log(b_s - \gamma_s \times h_{sp}) \end{aligned}$$

Then,

$$\begin{aligned} \frac{\partial U}{\partial b_c} &= -\frac{1}{-b_c - b_s + h_p + h_{\mathrm{sp}} + y_i} + \frac{\beta_c}{b_c - \theta h_p - h_{\mathrm{sp}}\gamma_c} &= 0 \\ \frac{\partial^2 U}{\partial {b_c}^2} &= -\frac{1}{(-b_c - b_s + h_p + h_{\mathrm{sp}} + y_i)^2} - \frac{\beta_c}{(b_c - \theta h_p - h_{\mathrm{sp}}\gamma_c)^2} &< 0 \\ \frac{\partial U}{\partial b_s} &= -\frac{1}{-b_c - b_s + h_p + h_{\mathrm{sp}} + y_i} + \frac{\beta_s}{b_s - h_{\mathrm{sp}}\gamma_s} &= 0 \\ \frac{\partial^2 U}{\partial {b_s}^2} &= -\frac{1}{(-b_c - b_s + h_p + h_{\mathrm{sp}} + y_i)^2} - \frac{\beta_s}{(b_s - h_{\mathrm{sp}}\gamma_s)^2} &< 0 \\ \frac{\partial^2 U}{\partial b_c \partial b_s} &= -\frac{1}{(-b_c - b_s + h_p + h_{\mathrm{sp}} + y_i)^2} \end{aligned}$$

$$\begin{aligned} &\frac{\partial^2 U}{\partial {b_c}^2}\frac{\partial^2 U}{\partial {b_s}^2} - \left(\frac{\partial^2 U}{\partial b_c \partial b_s}\right)^2 \\ &= \frac{1}{(-b_c - b_s + h_p + h_{\mathrm{sp}} + y_i)^2} \times \left(\frac{\beta_c}{(b_c - \theta h_p - h_{\mathrm{sp}}\gamma_c)^2} + \frac{\beta_s}{(b_s - h_{\mathrm{sp}}\gamma_s)^2}\right) \\ &+ \frac{\beta_c}{(b_c - \theta h_p - h_{\mathrm{sp}}\gamma_c)^2} \times \frac{\beta_s}{(b_s - h_{\mathrm{sp}}\gamma_s)^2} \end{aligned}$$

Because $\frac{\partial^2 U}{\partial {b_c}^2} < 0$ and $\frac{\partial^2 U}{\partial {b_s}^2} < 0$, $\frac{\partial^2 U}{\partial {b_c}^2}\frac{\partial^2 U}{\partial {b_s}^2} - \left(\frac{\partial^2 U}{\partial b_c \partial b_s}\right)^2 > 0$ for all b_c and b_s, then, the utility $U(b_c, b_s)$ will reach its maximum, when

$$\begin{aligned} b_c^* &= \frac{y_i\beta_c}{1 + \beta_c + \beta_s} + \frac{h_p(\theta + \beta_c + \theta\beta_s)}{1 + \beta_c + \beta_s} + \frac{h_{\mathrm{sp}}((1 + \beta_s)\gamma_c + \beta_c(1 - \gamma_s))}{1 + \beta_c + \beta_s} \\ b_s^* &= \frac{y_i\beta_s}{1 + \beta_c + \beta_s} + \frac{h_p(1 - \theta)\beta_s}{1 + \beta_c + \beta_s} + \frac{h_{\mathrm{sp}}((1 + \beta_c)\gamma_s + \beta_s(1 - \gamma_c))}{1 + \beta_c + \beta_s} \end{aligned}$$

There are some other propositions in the pure CBFT model, where $\beta_c, \beta_s > 0$, $0 < \gamma_s \leq 1$, $|\theta| + |\gamma_c| \neq 0, 0 \leq \theta, \gamma_c \leq 1$, and $\gamma_c + \gamma_s \leq 1$:

Proposition 3. In a stronger family tradition toward children, *ceteris paribus*, the bequest to the child increases while the bequest to the spouse decreases. In a stronger family tradition toward the spouse, *ceteris paribus*, the bequest to the child decreases while the bequest to the spouse increases.

$$\begin{aligned}
\frac{\partial b_c^*}{\partial \beta_c} &= \frac{(1+\beta_s)(y_i+(1-\theta)h_p+h_{\mathrm{sp}}(1-\gamma_c-\gamma_s))}{(1+\beta_c+\beta_s)^2} &> 0\\
\frac{\partial b_s^*}{\partial \beta_c} &= -\frac{\beta_s(y_i+(1-\theta)h_p+h_{\mathrm{sp}}(1-\gamma_c-\gamma_s))}{(1+\beta_c+\beta_s)^2} &< 0\\
\frac{\partial b_c^*}{\partial \beta_s} &= -\frac{\beta_c(y_i+(1-\theta)h_p+h_{\mathrm{sp}}(1-\gamma_c-\gamma_s))}{(1+\beta_c+\beta_s)^2} &< 0\\
\frac{\partial b_s^*}{\partial \beta_s} &= \frac{(1+\beta_c)(y_i+(1-\theta)h_p+h_{\mathrm{sp}}(1-\gamma_c-\gamma_s))}{(1+\beta_c+\beta_s)^2} &> 0
\end{aligned}$$

Proposition 4. When there is greater weight on children in the P-R-C community, *ceteris paribus*, the bequest to the child increases while the bequest to the spouse decreases.

$$\begin{aligned}
\frac{\partial b_c^*}{\partial \theta} &= \frac{h_p(1+\beta_s)}{1+\beta_c+\beta_s} &> 0\\
\frac{\partial b_s^*}{\partial \theta} &= -\frac{h_p\beta_s}{1+\beta_c+\beta_s} &< 0
\end{aligned}$$

Proposition 5. When there is greater weight on children in the SP-S-C community, *ceteris paribus*, the bequest to the child increases while the bequest to the spouse decreases. When there is greater weight on the spouse in the SP-S-C community, *ceteris paribus*, the bequest to the child decreases while the bequest to the spouse increases.

$$\begin{aligned}
\frac{\partial b_c^*}{\partial \gamma_c} &= \frac{h_{\mathrm{sp}}(1+\beta_s)}{1+\beta_c+\beta_s} &> 0\\
\frac{\partial b_s^*}{\partial \gamma_c} &= -\frac{h_{\mathrm{sp}}\beta_s}{1+\beta_c+\beta_s} &< 0\\
\frac{\partial b_c^*}{\partial \gamma_s} &= -\frac{h_{\mathrm{sp}}\beta_c}{1+\beta_c+\beta_s} &< 0\\
\frac{\partial b_s^*}{\partial \gamma_s} &= \frac{h_{\mathrm{sp}}(1+\beta_c)}{1+\beta_c+\beta_s} &> 0
\end{aligned}$$

Appendix 4-1D

Suppose $x = \frac{\beta_{cf}}{\beta_{cm}}$ and $y = \frac{\beta_{sf}}{\beta_{sm}}$, then $x\beta_{cm} = \beta_{cf}$ and $y\beta_{sm} = \beta_{sf}$,

$$\begin{cases} \frac{\beta_{cf}}{\beta_{cm}} > \frac{1+\beta_{sf}}{1+\beta_{sm}} \\ \frac{\beta_{sf}}{\beta_{sm}} > \frac{1+\beta_{cf}}{1+\beta_{cm}} \end{cases} \Leftrightarrow \begin{cases} x > \frac{1+y\beta_{sm}}{1+\beta_{sm}} = 1 + \frac{(y-1)\beta_{sm}}{1+\beta_{sm}} \\ y > \frac{1+x\beta_{cm}}{1+\beta_{cm}} = 1 + \frac{(x-1)\beta_{cm}}{1+\beta_{cm}} \end{cases} \Leftrightarrow \begin{cases} x-1 > \frac{\beta_{sm}}{1+\beta_{sm}}(y-1) \\ y-1 > \frac{\beta_{cm}}{1+\beta_{cm}}(x-1) \end{cases}$$

When $y - 1 < 0$,

$$\begin{cases} x-1 > \frac{\beta_{sm}}{1+\beta_{sm}}(y-1) \\ y-1 > \frac{\beta_{cm}}{1+\beta_{cm}}(x-1) \end{cases} \Leftrightarrow \begin{cases} \frac{x-1}{y-1} < \frac{\beta_{sm}}{1+\beta_{sm}} \\ \frac{x-1}{y-1} > \frac{1+\beta_{cm}}{\beta_{cm}} \end{cases} \Leftrightarrow \frac{1+\beta_{cm}}{\beta_{cm}} < \frac{x-1}{y-1} < \frac{\beta_{sm}}{1+\beta_{sm}}$$

Because $0 < \frac{\beta_{sm}}{1+\beta_{sm}} < \frac{1+\beta_{cm}}{\beta_{cm}}$, then, $(x-1)/(y-1)$ does not exist. In this case, $y - 1 < 0$ is rejected.

When $y - 1 > 0$,

$$\begin{cases} x-1 > \frac{\beta_{sm}}{1+\beta_{sm}}(y-1) \\ y-1 > \frac{\beta_{cm}}{1+\beta_{cm}}(x-1) \end{cases} \Leftrightarrow \begin{cases} \frac{x-1}{y-1} > \frac{\beta_{sm}}{1+\beta_{sm}} \\ \frac{x-1}{y-1} < \frac{1+\beta_{cm}}{\beta_{cm}} \end{cases} \Leftrightarrow \frac{\beta_{sm}}{1+\beta_{sm}} < \frac{x-1}{y-1} < \frac{1+\beta_{cm}}{\beta_{cm}}$$

Because $0 < \frac{\beta_{sm}}{1+\beta_{sm}} < \frac{1+\beta_{cm}}{\beta_{cm}}$ and $y - 1 > 0$, then, $x - 1 > 0$. In this case, $x > 1 \Leftrightarrow \beta_{cf} > \beta_{cm}$ and $y > 1 \Leftrightarrow \beta_{sf} > \beta_{sm}$.

Appendix 4-2 Full Results for Table 4-6 (Coefficients)

Female	TO_CHILD				TO_SPOUSE			
	Panel 1	Panel 2	Panel 3	Panel 4	Panel 1	Panel 2	Panel 3	Panel 4
INH_P	0.2058*	0.2058*	0.2058*	0.2058*	-0.0065	-0.0065	-0.0065	-0.0065
	(0.11)	(0.11)	(0.11)	(0.11)	(0.12)	(0.12)	(0.12)	(0.12)
INH_SP	0.2898***	0.2898***	0.2898***	0.2898***	0.3007***	0.3007***	0.3007***	0.3007***
	(0.11)	(0.11)	(0.11)	(0.11)	(0.12)	(0.12)	(0.12)	(0.12)
EXPINH_P	0.2429**	0.2429**	0.2429**	0.2429**	0.2320**	0.2320**	0.2320**	0.2320**
	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)
EXPINH_SP	0.0966	0.0966	0.0966	0.0966	0.1473	0.1473	0.1473	0.1473
	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)
HHINC	0.2424***	0.2424***	0.2424***	0.2424***	0.2291***	0.2291***	0.2291***	0.2291***
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
CHILDNUM	-0.1649***	-0.1649***	-0.1649***	-0.1649***	-0.0890	-0.0890	-0.0890	-0.0890
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
FAITH	0.0069	0.0069	0.0069	0.0069	0.0692*	0.0692*	0.0692*	0.0692*
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
LIFEEXP	0.4837	-0.1612	-1.1170***	-1.3974***	-0.1446	-0.5790*	-1.7038***	-2.0365***
	(0.52)	(0.33)	(0.33)	(0.52)	(0.42)	(0.31)	(0.36)	(0.70)
LIFEEXP × LIFEEXP	-0.0260	0.0553	0.1881***	0.2312***	0.0276	0.0847**	0.2433***	0.3059***
	(0.07)	(0.04)	(0.04)	(0.06)	(0.05)	(0.04)	(0.05)	(0.09)
NOHIGH	0.3396*	0.3396*	0.3396*	0.3396*	0.4471**	0.4471**	0.4471**	0.4471**
	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)	(0.20)
HIGHSCH	0.4401***	0.4401***	0.4401***	0.4401***	0.4700***	0.4700***	0.4700***	0.4700***
	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)
Constant	-0.7304	-1.0530	-1.4577**	-2.9790***	-0.0852	-0.6109	-1.0057	-2.8350**
	(0.99)	(0.71)	(0.73)	(1.08)	(0.83)	(0.67)	(0.75)	(1.36)
Observations	1891				1891			
Pseudo R^2	0.0256				0.0154			

* p < 0.1, ** p < 0.05, *** p < 0.01. Robust standard errors in parentheses.

Male	TO_CHILD				TO_SPOUSE			
	Panel 1	Panel 2	Panel 3	Panel 4	Panel 1	Panel 2	Panel 3	Panel 4
INH_P	0.1905*	0.1905*	0.1905*	0.1905*	0.1330	0.1330	0.1330	0.1330
	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)
INH_SP	0.1512	0.1512	0.1512	0.1512	0.2257	0.2257	0.2257	0.2257
	(0.15)	(0.15)	(0.15)	(0.15)	(0.14)	(0.14)	(0.14)	(0.14)
EXPINH_P	0.1763*	0.1763*	0.1763*	0.1763*	-0.0174	-0.0174	-0.0174	-0.0174
	(0.10)	(0.10)	(0.10)	(0.10)	(0.11)	(0.11)	(0.11)	(0.11)
EXPINH_SP	0.0748	0.0748	0.0748	0.0748	0.0684	0.0684	0.0684	0.0684
	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)
HHINC	0.1844**	0.1844**	0.1844**	0.1844**	0.2847*	0.2517***	0.0677	-0.2357
	(0.08)	(0.08)	(0.08)	(0.08)	(0.16)	(0.09)	(0.08)	(0.15)
CHILDNUM	-0.2893***	-0.2893***	-0.2893***	-0.2893***	-0.3055***	-0.3055***	-0.3055***	-0.3055***
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
FAITH	0.0771	0.1057*	-0.0588	-0.2212	-0.0641	0.1298*	-0.0052	-0.0621
	(0.10)	(0.06)	(0.06)	(0.14)	(0.11)	(0.07)	(0.05)	(0.11)
LIFEEXP	-0.1069	-0.1069	-0.1069	-0.1069	-0.7007**	-0.5228*	-0.6503**	-0.4801
	(0.30)	(0.30)	(0.30)	(0.30)	(0.30)	(0.29)	(0.29)	(0.30)
LIFEEXP × LIFEEXP	0.0846*	0.0846*	0.0846*	0.0846*	0.1364***	0.1364***	0.1364***	0.1364***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
NOHIGH	-0.0092	-0.0092	-0.0092	-0.0092	-0.3465**	-0.3465**	-0.3465**	-0.3465**
	(0.16)	(0.16)	(0.16)	(0.16)	(0.16)	(0.16)	(0.16)	(0.16)
HIGHSCH	0.0170	0.0170	0.0170	0.0170	-0.2075**	-0.2075**	-0.2075**	-0.2075**
	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)
Constant	1.2923**	-0.3594	-1.9526***	-3.6063***	2.7915**	0.6293	0.6097	-0.0798
	(0.62)	(0.60)	(0.59)	(0.62)	(1.10)	(0.67)	(0.61)	(1.10)
Observations	1743				1743			
Pseudo R^2	0.0300				0.0239			

* p < 0.1, ** p < 0.05, *** p < 0.01. Robust standard errors in parentheses.

Appendix 4-3 Full results for Table 4-7 (Marginal Effects)

Female	BA=1	BA=2	BA=3	BA=4	BA=5
			TO_CHILD		
INH_P	-0.0140*	-0.0275*	0.0046*	0.0288*	0.0081*
	(0.01)	(0.01)	(0.00)	(0.02)	(0.00)
INH_SP	-0.0193***	-0.0385***	0.0051	0.0410**	0.0117**
	(0.01)	(0.01)	(0.00)	(0.02)	(0.01)
EXPINH_P	-0.0166**	-0.0326**	0.0058*	0.0339**	0.0095**
	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)
EXPINH_SP	-0.0068	-0.0131	0.0029	0.0133	0.0037
	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)
HHINC	-0.0173***	-0.0329***	0.0081*	0.0331***	0.0090***
	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)
CHILDNUM	0.0118***	0.0224***	-0.0055**	-0.0225***	-0.0061**
	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)
FAITH	-0.0005	-0.0009	0.0002	0.0009	0.0003
	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)
LIFEEXP	-0.0208***	-0.0308***	0.0033	0.0366***	0.0118***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)
NOHIGH	-0.0289*	-0.0469*	0.0235*	0.0418*	0.0105
	(0.02)	(0.03)	(0.01)	(0.02)	(0.01)
HIGHSCH	-0.0360***	-0.0605***	0.0266**	0.0556***	0.0143***
	(0.01)	(0.02)	(0.01)	(0.02)	(0.00)
			TO_SPOUSE		
INH_P	0.0008	0.0007	-0.0009	-0.0006	-0.0001
	(0.02)	(0.01)	(0.02)	(0.01)	(0.00)
INH_SP	-0.0365***	-0.0348**	0.0379***	0.0287**	0.0047**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)
EXPINH_P	-0.0289**	-0.0266**	0.0305**	0.0215**	0.0035**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)
EXPINH_SP	-0.0186	-0.0168	0.0198	0.0134	0.0022
	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)
HHINC	-0.0296***	-0.0258***	0.0317***	0.0204***	0.0033***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)
CHILDNUM	0.0115	0.0100	-0.0123	-0.0079	-0.0013
	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)
FAITH	-0.0089*	-0.0078*	0.0096	0.0062*	0.0010
	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)
LIFEEXP	-0.0078	-0.0042	0.0015	0.0072	0.0033*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)
NOHIGH	-0.0654**	-0.0450**	0.0702**	0.0348**	0.0054*
	(0.03)	(0.02)	(0.03)	(0.02)	(0.00)
HIGHSCH	-0.0683***	-0.0476***	0.0733***	0.0369***	0.0057***
	(0.02)	(0.01)	(0.02)	(0.01)	(0.00)

Male	BA=1	BA=2	BA=3	BA=4	BA=5
			TO_CHILD		
INH_P	-0.0125*	-0.0253*	-0.0014	0.0291*	0.0100*
	(0.01)	(0.01)	(0.00)	(0.02)	(0.01)
INH_SP	-0.0098	-0.0200	-0.0015	0.0232	0.0081
	(0.01)	(0.02)	(0.00)	(0.02)	(0.01)
EXPINH_P	-0.0117*	-0.0236*	-0.0006	0.0268*	0.0091*
	(0.01)	(0.01)	(0.00)	(0.02)	(0.01)
EXPINH_SP	-0.0050	-0.0100	-0.0003	0.0114	0.0039
	(0.01)	(0.02)	(0.00)	(0.02)	(0.01)
HHINC	-0.0125**	-0.0248**	-0.0000	0.0279**	0.0094**
	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)
CHILDNUM	0.0196***	0.0389***	0.0000	-0.0438***	-0.0147***
	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)
FAITH	-0.0052	-0.0162	0.0333**	-0.0007	-0.0112
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
LIFEEXP	-0.0261***	-0.0518***	-0.0000	0.0583***	0.0195***
	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)
NOHIGH	0.0006	0.0012	-0.0000	-0.0014	-0.0005
	(0.01)	(0.02)	(0.00)	(0.02)	(0.01)
HIGHSCH	-0.0012	-0.0023	-0.0000	0.0026	0.0009
	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)
			TO_SPOUSE		
INH_P	-0.0066	-0.0148	-0.0104	0.0236	0.0083
	(0.00)	(0.01)	(0.01)	(0.02)	(0.01)
INH_SP	-0.0106*	-0.0245*	-0.0195	0.0398	0.0147
	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)
EXPINH_P	0.0009	0.0020	0.0013	-0.0031	-0.0011
	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)
EXPINH_SP	-0.0034	-0.0077	-0.0053	0.0121	0.0042
	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)
HHINC	-0.0145*	-0.0267**	0.0251	0.0304*	-0.0143
	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)
CHILDNUM	0.0155***	0.0345***	0.0227***	-0.0542***	-0.0185***
	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)
FAITH	0.0033	-0.0245***	0.0225*	0.0025	-0.0038
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
LIFEEXP	-0.0047	-0.0395***	0.0103	0.0150	0.0189***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
NOHIGH	0.0180*	0.0395**	0.0244**	-0.0612**	-0.0206**
	(0.01)	(0.02)	(0.01)	(0.03)	(0.01)
HIGHSCH	0.0101**	0.0229**	0.0168**	-0.0367**	-0.0131**
	(0.00)	(0.01)	(0.01)	(0.02)	(0.01)

Appendix 4-4 Summary Statistics Table 4-9

		All	
Variable	Definition	Mean	S.D.
TO_CHILD	I want to leave my children as much of my inheritance as possible	3.00	1.00
TO_SPOUSE	I want to leave my spouse as much of my inheritance as possible	2.94	1.02
TRANS_PR	Receive transfers of wealth from parents	0.02	0.14
INH_PR	Receive an inheritance from parents	0.22	0.42
NONE_PR	Receive nothing from parents	0.76	0.43
TRANS_SPR	Receive transfers of wealth from spouse's parents	0.01	0.12
INH_SPR	Receive an inheritance from spouse's parents	0.16	0.36
NONE_SPR	Receive nothing from spouse's parents	0.83	0.38
EXPTRANS_PR	Expect to receive transfers of wealth from parents	0.20	0.40
EXPINH_PR	Expect to receive an inheritance from parents	0.13	0.33
EXPNONE_PR	Expect to receive nothing from parents	0.67	0.47
EXPTRANS_SPR	Expect to receive transfers of wealth from spouse's parents	0.16	0.36
EXPINH_SPR	Expect to receive an inheritance from spouse's parents	0.10	0.30
EXPNONE_SPR	Expect to receive nothing from spouse's parents	0.74	0.44
FEMALE	Female dummy	0.53	0.50
HHINC	Log of household income	6.39	0.62
CHILDNUM	Number of children	2.16	0.73
FAITH	I am deeply religious	1.70	1.06
AGE	Respondent's age	52.02	11.55
LIFEEXP	Life expectancy (in decades)	3.33	1.12
NOHIGH	Did not finish high school	0.10	0.29
HIGHSCH	Graduate from high school but not graduate from college	0.66	0.47
COLLEGE	Graduate from college or higher	0.25	0.43
Observations		3,028	

Appendix 4-5 Full Results for Table 4-9 (Marginal Effects)

TO_CHILD	BA=1	BA=2	BA=3	BA=4	BA=5
TRANS_PR	0.0100	0.0197	-0.0027	-0.0205	-0.0065
	(0.02)	(0.04)	(0.01)	(0.04)	(0.01)
INH_PR	-0.0099*	-0.0213*	-0.0012	0.0241*	0.0083*
	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)
TRANS_SPR	-0.0163	-0.0359	-0.0037	0.0414	0.0146
	(0.01)	(0.03)	(0.01)	(0.04)	(0.02)
INH_SPR	-0.0190***	-0.0423***	-0.0059	0.0494***	0.0178***
	(0.01)	(0.01)	(0.00)	(0.02)	(0.01)
EXPTRANS_PR	-0.0140**	-0.0300**	-0.0015	0.0339**	0.0116**
	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)
EXPINH_PR	-0.0126*	-0.0267*	-0.0009	0.0299*	0.0102*
	(0.01)	(0.01)	(0.00)	(0.02)	(0.01)
EXPTRANS_SPR	-0.0061	-0.0130	-0.0004	0.0146	0.0050
	(0.01)	(0.01)	(0.00)	(0.02)	(0.01)
EXPINH_SPR	-0.0022	-0.0045	0.0000	0.0050	0.0017
	(0.01)	(0.02)	(0.00)	(0.02)	(0.01)
FEMALE	0.0249***	0.0522***	0.0005	-0.0579***	-0.0196***
	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)
HHINC	-0.0115***	-0.0242***	0.0001	0.0266***	0.0089***
	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)
CHILDNUM	0.0121***	0.0254***	-0.0001	-0.0280***	-0.0094***
	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)
FAITH	-0.0013	-0.0027	0.0000	0.0030	0.0010
	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
LIFEEXP	-0.0217***	-0.0455***	0.0003	0.0502***	0.0168***
	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)
NOHIGH	-0.0127	-0.0265	0.0003	0.0292	0.0098
	(0.01)	(0.02)	(0.00)	(0.02)	(0.01)
HIGHSCH	-0.0084	-0.0172	0.0010	0.0186	0.0061
	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)
GIVE_C_2%	-0.0474***	-0.0540**	0.0304***	0.0562**	0.0149**
	(0.02)	(0.02)	(0.01)	(0.02)	(0.01)
GIVE_C_5%	-0.0597***	-0.0717***	0.0326***	0.0775***	0.0213***
	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)
GIVE_C_10%	-0.0722***	-0.0421**	-0.0159	0.0953***	0.0349***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)
GIVE_C_20%	-0.1106***	-0.0611**	-0.0201	0.1522***	0.0395***
	(0.02)	(0.02)	(0.03)	(0.02)	(0.01)
GIVE_P_2%	-0.0109	-0.0273	-0.0031	0.0310	0.0103
	(0.01)	(0.03)	(0.00)	(0.03)	(0.01)
GIVE_P_5%	0.0056	0.0129	-0.0009	-0.0135	-0.0041
	(0.01)	(0.02)	(0.00)	(0.03)	(0.01)
GIVE_P_10%	0.0008	0.0018	-0.0000	-0.0019	-0.0006
	(0.01)	(0.02)	(0.00)	(0.02)	(0.01)
GIVE_P_20%	0.0332*	-0.0550*	0.0089	-0.0094	0.0223
	(0.02)	(0.03)	(0.03)	(0.03)	(0.01)
Observations	3028				
Pseudo R^2	0.0344				

* p < 0.1, ** p < 0.05, *** p < 0.01. Robust standard errors in parentheses.

TO_SPOUSE	BA=1	BA=2	BA=3	BA=4	BA=5
TRANS_PR	0.0325	0.0456	-0.0184	-0.0499	-0.0099
	(0.03)	(0.04)	(0.02)	(0.04)	(0.01)
INH_PR	-0.0029	-0.0048	0.0005	0.0059	0.0013
	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)
TRANS_SPR	-0.0224	-0.0376	0.0002	0.0488	0.0110
	(0.02)	(0.03)	(0.01)	(0.04)	(0.01)
INH_SPR	-0.0283***	-0.0487***	-0.0036	0.0653***	0.0152***
	(0.01)	(0.01)	(0.01)	(0.02)	(0.00)
EXPTRANS_PR	-0.0084	-0.0146	0.0013	0.0178	0.0038
	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)
EXPINH_PR	0.0280	-0.0483**	0.0310	-0.0146	0.0039
	(0.02)	(0.02)	(0.03)	(0.02)	(0.01)
EXPTRANS_SPR	-0.0102	-0.0168	0.0012	0.0212	0.0046
	(0.01)	(0.01)	(0.00)	(0.02)	(0.00)
EXPINH_SPR	-0.0020	-0.0032	0.0005	0.0038	0.0008
	(0.01)	(0.01)	(0.00)	(0.02)	(0.00)
FEMALE	0.1006***	0.1179***	0.0704***	-0.2276***	-0.0613***
	(0.01)	(0.02)	(0.02)	(0.02)	(0.01)
HHINC	-0.0068	-0.0109	0.0015	0.0133	0.0028
	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)
CHILDNUM	0.0149***	0.0239***	-0.0033*	-0.0292***	-0.0063***
	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)
FAITH	-0.0059	-0.0185***	0.0295***	-0.0029	-0.0022
	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)
LIFEEXP	-0.0081	-0.0249***	0.0106	0.0097	0.0127***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)
NOHIGH	-0.0004	-0.0186	0.0540*	-0.0539**	0.0190
	(0.02)	(0.03)	(0.03)	(0.03)	(0.01)
HIGHSCH	-0.0021	-0.0034	0.0005	0.0042	0.0008
	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)
GIVE_C_2%	-0.0232	-0.0309	0.0157	0.0322	0.0062
	(0.02)	(0.02)	(0.01)	(0.02)	(0.00)
GIVE_C_5%	-0.0421***	-0.0608***	0.0206**	0.0684***	0.0139***
	(0.01)	(0.02)	(0.01)	(0.02)	(0.00)
GIVE_C_10%	-0.0405***	-0.0580***	0.0207**	0.0648***	0.0131***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)
GIVE_C_20%	-0.0384***	-0.0546***	0.0205**	0.0604***	0.0121***
	(0.01)	(0.02)	(0.01)	(0.02)	(0.00)
GIVE_P_2%	-0.0271*	-0.0416*	0.0094	0.0490*	0.0103*
	(0.01)	(0.02)	(0.01)	(0.03)	(0.01)
GIVE_P_5%	-0.0077	-0.0109	0.0044	0.0119	0.0023
	(0.01)	(0.02)	(0.01)	(0.02)	(0.00)
GIVE_P_10%	-0.0205	-0.0305	0.0089	0.0350*	0.0071*
	(0.01)	(0.02)	(0.01)	(0.02)	(0.00)
GIVE_P_20%	-0.0313**	-0.0488**	0.0088	0.0588**	0.0125**
	(0.01)	(0.02)	(0.01)	(0.02)	(0.01)
Observations	3028				
Pseudo R^2	0.0590				

* p < 0.1, ** p < 0.05, *** p < 0.01. Robust standard errors in parentheses.

Chapter 5.
Conclusion and Discussion

This dissertation examined the effects of the community in some contexts under other-regarding preferences. The empirical and/or theoretical results demonstrate the impact of the community on subjective well-being and individuals' bequest motives as well as community-based indirect reciprocity within the family.

Chapter 2 discusses reference groups, the community that matters to individuals for their standard of living comparison, and the influence of an individual's reference group itself on an individual's standard of living in the United States and Japan. The results show that most people will compare themselves to their neighbors instead of to the average person in the nation (which is often assumed in the macro and finance literature) or work colleagues and friends (reference groups in income comparison studies). The respondents' relative standard of living (RSOL) is lower than their reference groups' RSOL on average, and those who compare themselves to their neighbors will have slightly higher RSOL.

Chapter 3 examines altruistic bequest motives toward children within family communities involving two generations, that is, parents and children. The results reveal that American parents are more altruistic than Japanese parents when several socio-economic variables are controlled for. The significant gap in altruistic bequest motives between American and Japanese parents is mainly explained by differences in the coefficients. The results from this chapter provide implications in terms of designing appropriate tax policies, addressing mismatched nursing care needs, and promoting gender equality. In addition, the results on bequest and saving motives from Japan may be extended to other Asian countries facing declining fertility rates.

Chapter 4 analyzes community-based reciprocal bequest attitudes toward children and spouse. This chapter contributes to the theoretical and empirical evidence by demonstrating that the source of the inheritance has a different impact on bequest attitudes, which cannot be observed as well

in either the altruistic or joy of giving models. The empirical results from gender comparison suggest that the taxation on inheritance is less effective for females than for males. This chapter enhances our understanding of what motivates people to leave a bequest.

In Chapters 3 and 4, gender differences in bequest motives and attitudes in the Japanese sample should be read with caution. In Chapter 3, Japanese males are found to be more altruistic than Japanese females regarding bequest motives—Japanese males are more likely than females to leave a bequest no matter what, and Japanese females are more likely than males to leave whatever is left over. This indicates that Japanese females have lower α_c in the pure altruistic model than Japanese males. In Chapter 4, the empirical results suggest that for Japanese females, those who have received an inheritance from their own or from their spouse's parents are more likely to intend to leave as much as possible to their children; while for Japanese males, those who have received an inheritance from their own parents are more likely to intend to leave as much as possible to their children. This indicates that Japanese females are more likely to assign higher weights to the child in the Spouse's Parents-Spouse-Child community or higher family tradition to the child than Japanese males in the pure community-based family tradition model. These results are not contradictory.

Further Studies

The 2016 wave of the Preference Parameters Study (PPS) of Osaka University provides information on comparison of reference groups of assets. Further investigations on how people determine their reference groups for assets, in contrast to how they determine reference groups for standard of living, and the effects of reference groups on consumption, saving, and bequeathing motives could serve to shed more light on the impact of the community when individuals have other-regarding preferences.

Stark and Nicinska (2015) suggest that the effectiveness of tax could be muted if there is a family tradition of bequeathing. Whether tax has the same implications in the Community-based

Family Tradition (CBFT) model is not guaranteed. For example, the theoretical model extends the CBFT model by including tax rates and shows implications and propositions when tax rates change. The empirical analysis uses data from the 2011 wave of PPS, which covers a question concerning the inheritance tax increase and an individual's bequest plan. This is salient because wealth inequality hinges on intentional bequests and inheritance tax can lead parents to substitute *inter vivos* transfer for the intended bequest. How taxation works in community-based indirect reciprocity provides implications for the effectiveness of the fiscal policy.

Data limitations of the 2009 wave of PPS preclude this dissertation from further analysis on the amount of inheritance received and the amount of bequest intended. For further research on this issue, the empirical analysis will use data from the 2018 wave of the Japan Household Panel Survey by the Panel Data Research Center at Keio University. This survey includes unique questions concerning the amount of inheritance (and *inter vivos* transfer) by source, the intention to leave a bequest more/same/less than that received, and other detailed information on intergenerational transfers.

The analyses conducted in Chapter 4 identify correlation between inheritance receipt and bequest leaving intentions. Further research can deepen our understanding by using Differences-in-Differences and instrumental variables to identify causality between inheritance receipt and bequest leaving intentions. In addition, the CBFT model, pertaining to indirect reciprocity within the family community identified by consanguineal kinship, can be generalized to direct/indirect reciprocal and altruistic behavior/intention within the neighborhood community identified by intimacy. For example, one can consider the proximity of living area or common interests in hobbies instead of consanguineal kinship in the model. In these cases, one can consider gifts in terms of money and time instead of bequests in the model.

The growth of studies on individual-level behavior in a community provides insight into further research on community development. For example, with the knowledge of the neighborhood's positive impact on individuals' well-being, community building benefits all the members nearby.

With the knowledge of individuals' indirect reciprocity consideration, enhancing the linkage among the members in the community furnishes virtuous surroundings. These types of insight may be useful in further studies on policies to help the development of local communities under the ICT revolution and in improving child and elderly care in an aging society like Japan and in many other countries with low fertility rates.

Reference

Stark, O., & Nicinska, A. (2015). How inheriting affects bequest plans. *Economica*, *82*, 1126–1152.