

# Adoption and Family Reproduction in Early Modern Japan<sup>1)</sup>

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Using longitudinal population registers from two northeastern villages during 1716–1870, this study investigates the patterns and types of adoption, and explores factors associated with in-adoption from the perspectives of adopting heads and married women. The adoption of adults and sons-in-law were most prevalent. Event history analysis demonstrates that adoption was used by households of higher socioeconomic status, and those headed by females, never-married or divorced. The comparison of adoption and reproduction reveals that married women actively planned the timing of adoption and reproduction depending on their age, coresiding parents, and sex composition of surviving children. Adoption was an important mediator of demographic constraints and the ideal of family continuity on the eve of Japanese modernization.

JEL Classification Codes: J130, I90, N000

## Introduction

Adoption was an indispensable element of the Japanese family system to ensure succession in rural households. Succession or continuity of household (as in name, property and business), or *ie*, was the overriding aim of family continuity in agrarian Japan, and in turn, served as basis for agricultural and social developments in modern economy (Sakane 2011: 19). The survivorship of households, or to maintain the necessary number of households as productive units was also of direct concern for the village organization where lives were structured around farming and where the burden of tax was shared. Adoption, thus, was an important strategy to assure childless or sonless families to survive and continue by recruiting prospective heirs, on one hand, and to redistribute surplus sons of fertile families on the other (Kurosu and Ochiai 1995). Despite of its importance, the study of adoption and its relation to family and demography is still very limited in Japanese historical demography, due largely to the paucity of data sources that allow detailed observation of adoption. This study focuses on this rarely examined but important practice using longitudinal population registers from two northeastern villages in eighteenth and nineteenth century Japan. Using one of the best available data of early modern Japan, it investigates the patterns and types of

adoption and explores factors associated with adopting sons and daughters in relation to heirship strategy taken by the household head as well as reproductive strategies of married couples.

The example of the northeastern villages is particularly intriguing because of their adherence to *ie* ideals and the stem family principle (i.e., only one couple in each generation) (Oto 1996; Cornell 1987) despite of their environmental hardship (i.e., frequent cold summer and poor harvest) as well as the serious damages they suffered after a series of widespread famines. The population continued to decline until the mid-19th century. Despite of these circumstances, or because of these hardships, peasants appear to have been active agents who adjusted household size and composition for the integrity and survival of the households and to have achieved the overriding aim of family continuity. Recent studies reveal strategies taken by the farm households for their survival upon economic and demographic constraints—by controlling the number and composition of children (Tsuya and Kurosu 2010), allowing female headship (Okada and Kurosu 1998), and controlling the timing of siblings' departure in relation to heirs' marriage and first birth (Kurosu 1996). Being head or immediate members of the stem family reduced the mortality risk of individuals (Tsuya and Kurosu 2004). Thus individual life course was tightly bound to

and stratified by the stem family rules (Saito 2000). Adoption is likely to have been at work also within this stem family logic. Adoption is considered crucial in mediating or balancing household succession and demographic constraints—low fertility, relatively high mortality, and constant disruption of lives due to harvest failures and famines.

The following sections start with the discussion of adoption in Eurasian societies, sources and demographic backgrounds of this study, followed by how adoption and reproduction is measured in this study. Adoption has to be considered from both demand and supply sides. Demand side, “in-adoption,” refers to adopting sons and daughters into households of the adopter (adopting father, or, usually the head of household); and supply side, “out-adoption,” refers to adopting out sons and daughters from their household of origin to elsewhere. The focus of this study is on the demand side. Descriptive analysis of in-adoption in relation to household socioeconomic status and reproduction will be followed by event history analysis. It will explore within the multivariate context the effects of individual demographic, socioeconomic, household, and village characteristics on the likelihood of adoption in the two farming villages, using a discrete-time event history model. Factors associated with adoption should vary at household and individual (adopting couples) level. Thus, the first set of event history analysis is performed for all households with emphasis on socioeconomic status of household and heads’ demographic characteristics. The second set of analysis is performed for both reproduction (recorded births) and adoption for married women of reproductive age (15–49). The models applied in this study are modifications of the event history analysis used in the Eurasia project for examining demographic responses to economic stress and household context (Bengtsson, Campbell, Lee *et al.*, 2004; Tsuya, Wang, Alter, Lee, *et al.* 2010). This is one of the first systematic studies that applies event history analysis to in-adoption in early modern Japan. Although the number of villages is limited and the analysis is exploratory, the approach of this study is an

important step to advance our knowledge about the reproductive (both biological and social) and household strategies among peasants.

### Adoption in Eurasia and Japan

Adoption played a major role in many traditional Eurasian societies (Goody 1969: 66). The succession of family estate or name was of great importance, not only in societies that emphasized the preservation of family lines, but also in societies that placed less emphasis on succession but still needed heirs to inherit property (Wrigley 1978: 138). Still, the purpose of adoption in Europe is emphasized to be the welfare of the child, hence the fostering of orphans, bastards or foundlings; while in Asia, the major function of adoption is considered the provision of an heir (Goody 1969: 68). Empirical studies on adoption in East Asia have attempted to reveal the link between demographic constraints (low fertility or imbalanced sex ratio) and adoption practices, and discussed the importance of adoption practices for securing a child for family succession (Wolf and Huang 1980; Wang and Lee 1998; Kurosu and Ochiai 1995; Kim and Park 2010).

While adoption served as an important heirship strategy among East Asian families, the purpose of adoption practices was not limited to family succession. Chinese and Japanese parents also adopted children to obtain family labor or support in old age, to marry their children, and to maintain ritual and religious continuity (Lee and Wang 1999: 108; Takeda 1988: 312). Because of the difference (and emphasis) of purposes as well as customs and norms that prevailed, a large variation in practices of adoption existed even among East Asian populations where adoption practices were frequently used. The Japanese practice appears to contrast with other East Asian countries in at least three aspects. First, in China and Korea, where patrilineage plays an important role in society, “custom strictly prohibited adopting a male child from a non-agnate or allowed it only when one could not find an agnate willing to surrender one of his sons” (Wolf and Huang 1980: 108). However, in Japan,

where patrilineage in the strict sense does not exist (Nakane 1967: 84–85), adopted sons are taken both from among the kinsmen of the head and his wife and even “a man who has no kinship relation at all to the head” (Nakane 1967: 4). Second, the custom of adopting a son as a husband for one’s daughter, adopted son-in-law (婿養子 *mukoyoshi*),” is quite common in Japan, though prohibited in Korea and rare in China (Ueno 1988: 199). It should be noted however that there seem to exist regional variations in China. Wolf and Huang (1980: 216), for example, reported liberal communities (e.g. Huian hsien on the Fukien coast) in which people were entirely free to marry off their daughters virilocally or uxorilocally as they chose. Third, adult adoptions are the predominant form of adoption in Japan, but are vanishingly rare elsewhere in Asia (and the West) (Mehrotra, *et al.*, 2011). Adult adoption was not unknown, for example, among the Qing imperial nobility but was not a major pattern (Wang and Lee 1998)<sup>2</sup>. Adult adoption, as opposed to child adoption, was considered a strategy to secure an heir as the risk of dying reduced quickly after around age 10.

### Source, Setting and Measurement

#### (1) Source and Setting

This study draws its data from the local population registers called *ninbetsu-aratamecho* (NAC) in Shimomoriya and Niita, two farming villages in the present Fukushima prefecture in northeastern Japan. These NAC records extend over a period of about 150 years, 1716–1869 for Shimomoriya and 1720–1870 for Niita, with only a small number of intermittent years missing. The registers were compiled annually based on the principle of current domicile, that is, they are all *de facto*. Besides marriage and divorce, registers annotated all major demographic events, including birth, death, and migration for all individuals residing in the villages. In addition, exits from and entry to the villages (including movements within and outside the village) were recorded in detail, allowing this study to examine different types of adoption. Exits for unknown reasons were extremely

rare, accounting for less than 1 percent of all recorded exits in the NAC registers in both villages. Thus, their quality and length make these NAC registers some of the best documentation for historical population in Japan.

The two villages were almost exclusively agricultural. Situated at the foot of a mountain range, Shimomoriya was susceptible to cold summers and poor harvests resulting from chilly gusts off the mountains (Narimatsu 1985: 1–3). Niita was located on flat land and had less severe winter weather (Nariamtsu 1992: 4–6); nonetheless, the village was vulnerable to frequent floods lying on the banks of the Gohyaku River. Because of underdeveloped agricultural technologies at that time, the circumstances of the two villages were often at the mercy of fluctuations in agricultural output. The population trends of the two villages reflect the economic hardship of peasant life, being disturbed particularly by famines (Figure not shown). At the beginning of the registers the population of Niita was 538 and Shimomoriya 419, and they were stable in the first 35 years. After the Horeki famine in the 1750s, the population of both villages started to decline. Devastated by the great Tenmei famine in the 1780s, the village population further declined. It again took a dramatic downturn during the Tempo famine in the late 1830s, losing a total of 30–40 percent from the initial period. The populations started a gradual upturn only after 1840 (after the Tempo famine), with the general improvement of climate resulting in less frequent famines, and the development of agricultural techniques that improved the living standards in the two villages. The number of households also declined from the mid-1770s and became stable in the 1840s at 30–40% below the number of households in the early eighteenth century. As for the average size of households, however, it was stable around four members, which was small for a preindustrial population, and increased only after the Tempo famine in the 1830s to around 6 persons in both villages.

Recent studies revealed at least four characteristics important to understand the

relationship between demographic constraints and adoption. First, in the two villages of this study, the mortality level was at the higher end while the fertility level was at the lower end of the distribution among the observed villages of the same period (Tsuya and Kurosu 2004, 2010). Second, marriage was universal and extremely early (Kurosu, Tsuya, and Hamano 1999) possibly because of their higher mortality. Peasants entered service only after they married, so that they would not abscond. Marriage therefore served both as a protection for individuals by providing household membership, and as a security of bidding individuals to households. Third, peasants practiced a widespread and sophisticated use of sex- and parity-specific infanticide to achieve a relatively small family size with a sex-balanced (and possibly sex-ordered) offspring set (Tsuya and Kurosu 2010). Couples preferred to have a daughter as their first child. Once they had a girl, however, they opted to have a boy or two.

Finally, temporal differentials became clear in many demographic patterns. As discussed, after the Tempo famine in the 1830s, the population recovered, the number of households became finally stable, and household size increased. There were some notable changes in the socioeconomic distribution of household as well. The proportion of landless households declined over this period and the average size of landholding increased particularly among peasants who were at the bottom 50% of the distribution (Kurosu 2011). The mortality of female children declined almost linearly over time; the probability of a recorded birth became increasingly higher in the nineteenth century; increases in the likelihood of having a recorded female birth were especially notable and steady in the nineteenth century (Tsuya and Kurosu 2004, 2010). While the causality is not clear yet, these demographic changes (or improvements) certainly coincided with environmental improvement and economic development of the area. Due to the continuing agricultural commercialization and also because of the intensified need to increase rice production after the Tenmei famine in the 1780s, the domain government

reversed its official economic policy and began to encourage locally specialized production of cash crops such as mulberry and lacquer trees (Koriyama-shi 1981: 79–81; Nagata *et al.* 1998). This resulted in proto-industrialization of farming villages in the domain, as seen in the growth of silk textiles and lacquer industries. The improvement of agricultural technology was also noted, for example in the improvement of irrigation systems (Narimatsu 1992). Further, the improvement of climate is suggested as indicated by fewer numbers of devastating famines (Saito 2010). These economic and environmental changes all hint towards the improvement of living standards of villagers, particularly after the Tempo famine.

## (2) Adoption and reproduction

Adoption was often practiced among parents without any sons in the family in various parts of early modern Japan. However, some regional variations in the institution of adoption are suggested by anthropological field work of the early twentieth century (e.g. Takeuchi 1969; Otake 1988). The most general classifications for adoption are adoption of children (*yoshi* 養子 for sons and *yojo* 養女 for daughters), and “adoption of sons-in-law” (*muko-yoshi* 婿養子). A male son adopted for the purpose of becoming a daughter’s husband is an adopted son-in-law. This can be considered an uxorilocal marriage. Other forms of adoption include adoption of a couple (*fufu-yoshi* 夫婦養子), of a brother (*jun-yoshi* 順養子), and adoption as a means of acquiring labor power (*hokonin-yoshi* 奉公人養子). These and other types are said to vary, depending on period and region. It is worth noting that just like marriage, arrangement of adoptions often took place via a “go-between,” who was usually an acknowledged individual in the village (Kurosu and Ochiai 1995). A few remaining documents (contracts) upon adoption contained seals of the adoptee, his father and father-in-law to be, witnesses or go-betweens, and relatives as well as village officers (Yasuzawa 1972: 628). Although the documents come from the eighteenth century Tokyo area, they suggest that adoption required consent from the

village community and was not simply a matter of private kinship. Thus, the recruitment of adopted sons meant much more than establishing a private kinship and concerned the entire village community.

In this study, the timing of adoption is measured solely in terms of records in the NAC registers. In the population register, adoption is determined by the annotation of an exit or entry of an individual from/to a household. Adoption is annotated as being “adopted in” or “adopted out” (養子に遣わす *yoshi-ni-tsukawasu*); men being “adopted in/out as a son-in-law” (婿に縁付 *muko-ni-enduke*; 婿に遣わす *muko-ni-tsukawasu*). Combinations of these annotations, marital status, as well as relationship to the head allow us to examine in detail the distinction of adoption types discussed above. The distinctions of various forms of adoption have never been well clarified in Japanese historical demography as they are difficult to find without longitudinal and well described data. This study focuses on the two major types of adoptions, adopting sons & daughters (*yoshi* & *yojo*) and sons-in-law (*muko-yoshi*), and less frequent adoption of couples (*fufu-yoshi*).

As a way to place adoption in the context of reproductive strategy of married couples, this study also compares fertility of married women and their (and husbands’) adoption practices. It should be noted that the focus here is on the demand side of adoption (i.e., adopting sons and daughters). The supply side of adoption is also an important strategy for couples to deal with surplus children, but this will be dealt with in a separate paper. Following a previous study (Tsuya, Campbell, and Wang 2010), this study uses the term “reproduction,” net of mortality of infants who died before the registration due to natural and man-made causes rather than fertility in the usual sense. Despite the strengths of the NAC records mentioned above, they suffer, as do the population registers of all other Tokugawa villages, from the under-registration of infant deaths. Not all births and infant deaths were recorded in the registers—only those who survived from birth to the subsequent registration were

entered. Thus, the ‘births’ shown in this study are not actual births, but births who survived at least until first enumeration.

## Analysis

### (1) Types and age pattern of adoption

During the duration of the records of Shimomoriya and Niita 1716–1870, there were 712 cases of in-adoption and 485 cases of out-adoptions for males; and 134 cases of in-adoption and 127 cases of out-adoption for females. It is interesting to note that, while the number of female in and out adoption cases were about the same, in-adoptions for males were about 1.5 times higher than out-adoptions. For in-adoptions, we can further differentiate the type of adoption into three categories: adoption of son-in-law (*muko-yoshi*), adoption of sons and daughters (*yoshi* and *yojo*), and adoption of married couples (*fufu-yoshi*). As shown in Table 1, almost 70% of adoption cases were son-in-law adoptions. As for females, 60% of adoption cases were adoption of daughters. Altogether, 13% of adoption of males and females were those of couple adoption—an individual was adopted, and his wife (they were married before the adoption took place) and sometimes their children moved into the adopting household. This type of adoption has never been focused on in the studies of adoption in other areas. Rather than adopting sons or daughters who are going to build their own families (through marriages upon or after themselves being adopted), these couples could readily serve to succeed and become part of the labor force of the family. In that sense, they might have been even a short cut to securing the succession and ensuring the family labor.

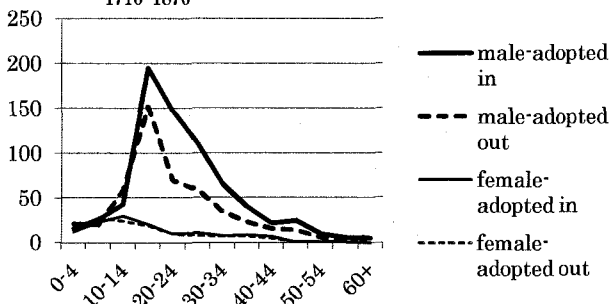
Figure 1 shows the age distribution at which adoption took place. The number of adopted sons started to increase at age 10–14 and peaked at age 15–19. About 80% of adoption took place during the age 10–34. Some adoption cases go well into age 50 and above. The oldest male adoptees were well into their sixties. The number of female adoption is considerably smaller than that of males and starts at an earlier age. By age 25–29, 80% of adoption is completed. Neverthe-

Table 1. Adopted Sons and Daughters by Type of Adoption: Shimomoriya and Niita, 1716-1870

Adoption	Male	Female	All
Sons-in-law	69.3	—	58.3
Sons&daughters	23.4	60.2	29.2
Couples	7.3	39.8	12.5
All(%)	100.0	100.0	100.0
N	709	133	842

Note) adopting sons-in-law (*muko-yoshi*, or uxori-local marriage); adopting sons and daughters (*yoshi and yojo*); adopting married couples (*fufu-yoshi*). Excludes 4 unknown type cases.

Figure 1. Age Distribution (number of cases) When Adopted In or Out: Male and Female Adoption in Shimomoriya and Niita 1716-1870



less, adoption continues well into the 40s. These later age groups tend to be adoptions of married couples. Some of these couples were adopted and brought their own children. Thus, adoption, particularly male adoption, in these villages was predominantly of adults confirming the Japanese pattern described above.

## (2) Adoption and socioeconomic status of household

This section examines the relationship between adoption and socioeconomic status of household. Socioeconomic status of household is measured by household landholding (*mochidaka in koku* 石) which is a continuous variable indicating the total productive

Table 2. Crude Rates of Adoption (per 1,000 households) by Socioeconomic Status of Household: Shimomoriya and Niita 1716-1870

(Adoption)	bottom 25%	mid 50%	top 25%	all
1716-1759	15.54	32.66	21.75	24.08
1760-1799	10.41	27.13	38.79	24.66
1800-1839	28.57	28.40	38.88	31.65
1840-1870	35.71	39.01	29.79	35.71
1716-1870	18.03	30.94	30.39	27.75

Table 3. Crude Rates of Adoption and Reproduction (per 1,000 married women) by Period: Shimomoriya and Niita 1716-1870

	Adoption	Reproduction
1716-1759	16.86	103.34
1760-1799	15.04	93.79
1800-1839	22.06	119.21
1840-1870	20.59	134.79
1716-1870	18.08	108.91

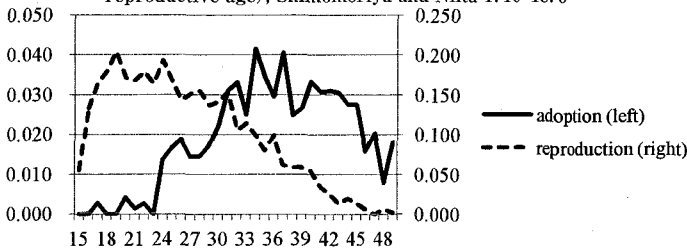
capacity of the land held by the household. This measures not only the amount of household income and economic resources available, but also the wealth and economic status of the household. Three categories of landholdings are constructed by the distribution of household landholding during the whole observation period—bottom 25% (below 6 *koku*), middle 50% (6 and above, and below 14 *koku*), and top 25% (14 and more *koku*). The demarcation between the bottom 25% and middle 50% roughly coincides with the concept of an independent household (*ikken-mae*) which held about 7 *koku* in this region (Narimatsu 1992).

Table 2 includes all in-adoption cases per 1,000 households by socioeconomic status and four periods. Overall adoption rates increased in the latter two periods—from 24-25 to 32-36 per thousand household. Adoption rates of mid 50% and top 25% households for the entire period are above 30 while that of the low 25% is 18. Although the rate of adoption was low, it is important to note that the household in the lowest socioeconomic status did adopt sons and daughters. Adoption was practiced in all social strata. Still, households of higher socioeconomic status have much higher adoption rates. It is, however, interesting to note the dramatic increase of adoption rates in the bottom 25% and mid 50%, particularly in the last period (1840-1870). Thus during the period when standard of living and fertility improved as discussed above, the rate of adoption also increased, particularly at the lower end of social strata.

## (3) Adoption and reproduction among married women

So far, the units of analysis of the above descriptive analysis have been household years as the concern was house continuity and labor. This section shifts the analysis from the perspective of household (head) to that of married women, i.e., the units of analysis are married women years in reproductive age (15-49). Table 3 contrasts the number of adoption and reproduction per 1,000 married women in reproductive age

Figure 2. Age Specific Reproduction Rates vs. Adoption Rates (per women in reproductive age), Shimomoriya and Niita 1716-1870



(15-49) by four periods. Adoption rates were low during the eighteenth century, around 15-17, but increased to 21-22 in the nineteenth century. The same holds for reproduction. Reproduction rates are below 103 in the eighteenth century but increased to 119-135. They were particularly high in the very last period in accordance with improvements of female births (Tsuya and Kurosu 2010). If couples used adoption to deal with the low fertility in the eighteenth century, we would expect adoption rates to go down once the fertility level improved. However, this was not the case. Both adoption and reproduction rates went up in the nineteenth century. This is an interesting puzzle to be explored in the near future<sup>3</sup>.

Finally, when it comes to the timing of adoption by women's age, adoption shows a clear lag behind reproduction. Figure 2 compares reproduction rates and adoption rates of married women by their age. Reproduction rates increase quickly after age 15, peak at age 19, maintain around 0.15 and 0.20 but quickly go down after age 31. This early stopping is a characteristic of reproductive behaviors among women in these villages (Tsuya and Kurosu 2010). Adoption rates on the other hand, start to increase after age 24 and go up quickly around the time reproduction rates go down. It is only after age 45 when adoption rates go back to the level of the late 20s. For married women and their husbands, adoption was practiced after the reproductive curve went down in the early 30s and well into their early 40s.

#### (4) Event history analysis of adoption

##### (4.1) Variables

In this last section of analysis, a discrete-time event history analysis of adoption is performed using a series of logistic regression

models. Because of the multiplicity of strategies involved in adoption, two different sets of analysis are performed. The first analysis relates households' probability of adopting a child during the next one year to their circumstances and heads' characteristics at or

before the beginning of the year. This part of the analysis examines all adoption cases and differentiates by type of adoption. The second analysis further examines the detailed mechanisms concerning adoption, focusing only on married women in reproductive ages (15-49) and by comparing the same models for adoption and reproduction. Types of adoption are not differentiated in the second analysis as the number of events become too small.

Thus, the dependent variable is a dichotomy indicating (1) whether household (heads in all ages and sex) adopted a son, daughter, or couple; and (2) whether married woman age 15-49 (and/or her husband) adopted a child or has a recorded birth within marriage in the next year. The units of analysis therefore are households years in the first set, and married women years in the second set of analysis. Three general groups of covariates are constructed in the same manner for both analyses: heads' or women's individual characteristics, family and household contexts, and socioeconomic factors. Both analyses control for time period, and residing village. The same covariates to show socioeconomic factors are used: household landholding (*mochidaka in koku*) indicates the expected yield of land owned by the household or in which a woman resided (categorical as in Table 2); and local rice price (the logarithm of raw rice prices in the local market of Aizu, which are time-lagged by one year) to measure the effect of local economic conditions. Socioeconomic status (SES) of household is expected to positively associate with adoption, since household succession was more important for households in higher socioeconomic standing. At the same time, just as was the case for first marriage (Tsuya and Kurosu 2000), the higher SES meant more resources and

bargaining power in recruiting sons-in-law<sup>4</sup>. Local rice price is hypothesized to reduce the chance of adoption. Just like marriage (Tsuya and Kurosu 2000), when times were bad, the arrangement of adoption was postponed.

For the first set of analysis, heads' characteristics consist of three variables: age, gender, and marital status. In this region female headship is considered a temporary solution upon sudden death or absconding of male heads (Okada and Kurosu 1998). A female head therefore should be eager to recruit a son to succeed. Marital status of head is extremely important as it indicates whether he or she was successful in the reproductive strategy of being/staying married. Compared to currently married heads, which are a proxy of having off-springs, never-married or divorced heads may seek to continue the household by adopting a son or a couple.

The second set of analysis includes women's current age, which consists of six age groups covering women's reproductive years from age 15 to 49. Since reproduction is a function of age in the biological sense, and deliberate reproductive control and planning of adoption may also depend on women's age, it is important to account for this demographic factor. Further, women's family and household contexts are measured by four covariates: sex composition of surviving children, whether the current marriage is a remarriage, presence of parents or parents-in-law, and whether they are household head or heads' wives. All family and household variables are specified relative to the index women. All of these variables have proven important in previous studies to account for reproduction, marriage, divorce, and remarriage. In particular, two variables are expected to be important: sex composition of surviving children and presence of parent(s). Sex composition of surviving children is vital in determining reproduction where sex-selective and parity-specific infanticide were practiced extensively (Tsuya and Kurosu 2010). The similar strategy of balancing male-female children is expected for adoption practices as well. The presence of the senior generation in the household is important

because evidence from other Tokugawa Japanese villages showed that the presence of mother/mother-in-law had a positive reproductive effect, suggesting help from the senior generation of females in child care (Skinner 1988); also, the presence of parents was considered a proxy of a stable and sustainable household in the analyses of marriage and divorce (Tsuya and Kurosu 2000, Kurosu 2010).

#### (4.2) Results

Table 4 presents the result of event history analysis of the probability of adoption, and also separately for adoption of sons-in-law, sons and daughters, and couples. Some of the interesting findings include: (a) Adoption was three times more likely when the household was headed by females rather than males. (b) Compared to the low 25%, other households were twice as likely to practice adoption. (c) Adoption of sons and daughters was more likely among divorced or never-married heads compared to married ones. They were less likely to adopt sons-in-law, probably because of the lack of female children. (d) Adoption of couples was four times as likely among never-married heads compared to married heads (although we have to be careful with the interpretation of this due to the rare occurrence of the events). Thus, adoption was used by households of higher socioeconomic status and households headed by females who were serving as temporary heads. Also, when heads were not successful in their marriage (never-married or divorced), adoption (as well as remarriage, Kurosu 2007) provided a good solution to assure heirship.

Table 5 presents the results of the event-history analysis of the probability of adoption, comparing them to the results of a recorded marital birth for married women aged 15 to 49. Controlling for other factors, sex composition of surviving children showed the strongest association with both adoption and reproduction. Compared to women who had at least one son and one daughter alive, women without children or sons were 3.5 times more likely to adopt children. By contrast, those who had at least one son alive



Table 4. Estimated Odds Ratios of the Covariates from Discrete-Time Event History Analysis of Adoption: All Households in Shimomoriya and Niita 1716-1870

	Mean	All adoption		Sons-in-law		Sons and daughters		Couples	
		Odds Ratio	p-value	Odds Ratio	p-value	Odds Ratio	p-value	Odds Ratio	p-value
Socioeconomic Status of household									
hi	0.305	1.909	0.000	2.389	0.000	0.986	0.932	1.427	0.541
middle	0.461	1.695	0.000	1.930	0.000	0.751	0.175	2.348	0.050
low (ref)	0.139	1.000	—	1.000	—	1.000	—	1.000	—
unknown	0.095	0.668	0.019	0.783	0.220	0.380	0.017	0.923	0.918
Period									
1716-1759 (ref)	0.319	1.000	—	1.000	—	1.000	—	1.000	—
1760-1799	0.295	0.909	0.378	0.882	0.359	0.990	0.959	1.124	0.784
1800-1839	0.250	1.049	0.663	0.916	0.533	1.482	0.040	0.616	0.347
1840-1870	0.136	1.272	0.051	1.316	0.068	1.078	0.756	2.103	0.116
Head's characteristics									
Female head	0.050	2.646	0.000	3.199	0.000	1.833	0.014	2.252	0.123
Marital Status									
married	0.750	1.000	—	1.000	—	1.000	—	1.000	—
widowed	0.109	0.715	0.016	0.607	0.007	0.913	0.700	1.073	0.882
divorced	0.054	1.376	0.025	0.810	0.320	2.286	0.000	3.919	0.001
never-mar	0.078	0.987	0.937	0.586	0.024	1.615	0.057	4.438	0.005
unknown	0.009	0.316	0.108	0.559	0.419	—	—	—	—
Household yrs at risk		26,560		26,560		26,330		26,330	
Number of observations		754		480		227		44	
Log-likelihood		-3370.97		-2347.34		-1279.54		-303.05	
Chi (d.f.)		115.59 (13)		109.44 (13)		51.06 (12)		44.51 (12)	
Prob>chi2		0.000		0.000		0.000		0.000	

Note) The unit of analysis is household-year. Above controls for village and head's age. We need to be careful about the interpretation of adoption of married couples ("couples") because of its small number of occurrence.

had 60% less chance of adoption compared to those with a sex balanced set of surviving children. An interesting difference are women with only son(s). They were still eager to reproduce (almost twice as likely), probably in want of daughters, but they were no longer in need of using adoption. It is also interesting to notice that remarried women were 1.4 times more likely to practice adoption than those who were married for the first time. Remarriage and adoption together were part of important family building strategies.

Presence of parents mattered for both reproduction and adoption. Presence of both parents significantly increased the likelihood of both adoption and reproduction. This is consistent with previous studies on marriage and divorce, which found that parents provided resources and support necessary for recruiting sons-in-law and also for having births. As for the presence of a mother/mother-in-law (not a father/father-in-law), this also significantly increased the likelihood of both adoption and recorded births but probably in a different manner. As discussed elsewhere (Tsuya and Kurosu 2010: 227), the presence of a mother/mother-in-law was particularly significant for a recorded female birth, which implies that co-resident moth-

ers/mothers-in-law helped women to keep and care for baby girls. The senior female generation in a household was considered to have enabled women to avoid the infanticide of female babies by providing material and moral support. In case of adoption, the presence of mothers/mothers-in-law probably indicates the necessity of recruiting sons in the absence of fathers/fathers-in-law.

### Summary and Discussion

Using one of the best population registers in early modern Japan, this study investigated the patterns and types of adoption at individual level, and has examined factors associated with adoption from the perspectives of both household and married woman to reveal the importance of adoption practice as a family strategy. Adoption of adult males (i.e., not children whose survivorship were yet to be determined due to high mortality), in particular the adoption of sons-in-law (uxorilocal marriage) was the most prevalent in this region. However, adoption of children including females and adoption of married couples, types which were not common in central Japan (Kurosu and Ochiai 1995) were also observed. While adoption was more likely to be practiced among

Table 5 Estimated Effects of the Covariates from the Discrete-Time Event History Analysis of the Probability of In-Adoption vs. Marital Reproduction: Currently Married Women Age 15–49, Shimomoriya and Niita 1716–1870

	Mean	All in-adoptions		All births	
		odds ratio	p-value	odds ratio	p-value
Women's current age					
age 15–19	0.150	0.017	0.000	7.167	0.000
age 20–24	0.166	0.139	0.000	8.814	0.000
age 25–29	0.161	0.550	0.000	8.220	0.000
age 30–34	0.150	1.088	0.559	7.352	0.000
age 35–39	0.133	1.126	0.397	4.156	0.000
age 40–49 (reference)	0.240	1.000	—	1.000	—
Remarriage	0.144	1.367	0.006	0.959	0.600
Sex composition of surviving children					
no child alive	0.028	3.002	0.000	4.483	0.000
no daughter, only son(s) alive	0.228	0.404	0.000	1.726	0.000
no son, only daughter(s) alive	0.205	3.291	0.000	1.773	0.000
at least one son and one daughter alive	0.307	1.000	—	1.000	—
surviving child unknown	0.232	3.070	0.000	2.017	0.000
Parent-both alive	0.361	1.685	0.000	1.444	0.000
Only father	0.089	0.876	0.547	1.215	0.037
Only mother	0.149	1.501	0.010	1.406	0.000
No Parent	0.401	1.000	—	1.000	—
Household head or head's wife	0.646	2.238	0.000	1.185	0.003
Socioeconomic status of household					
high	0.210	1.033	0.852	1.130	0.140
middle	0.458	1.293	0.049	0.978	0.723
low (reference)	0.239	1.000	—	1.000	—
unknown	0.093	1.218	0.395	1.186	0.043
Log rice price lagged by 1 year	−0.245	0.869	0.478	1.004	0.964
Time period					
1716–1759 (reference)	0.335	1.000	—	1.000	—
1760–1799	0.287	0.693	0.011	0.927	0.235
1800–1839	0.229	1.086	0.550	1.197	0.011
1840–1870	0.149	1.126	0.475	1.442	0.000
Number of observations		20907		20907	
Number of events		390		2349	
Log-likelihood		1648.40		6533.93	
Chi-square (d.f.)		359.82 (23)		673.71 (23)	
Prob > chi-square		0.000		0.000	

Note) The unit of analysis is married women year. Above controls for village and household kin size.

households of higher socioeconomic status, it was not unknown among landless households. Also, the option of adoption was not limited to married heads. On the contrary, adoption of sons or couples was practiced more often among heads who were not successful in marriage; i.e., never-married and divorced. These findings suggest that adoption was indeed a strategy for family succession and obtaining family labor. The comparison between adoption and reproduction of married females (age 15–49) revealed that both events were actively planned depending on their reproductive capacity (age), availability of support by parents or mothers/mothers-in-law, and sex composition of surviving children.

Adoption can be considered a form of social reproduction that provides new insight to understanding low fertility in Japan. Frequent practices of sons-in-law adoption, together with the “daughter first” preference might imply a peasant strategy for swift and successful transition of headship in the villages with high mortality risk. Further, the idea that couples deliberately had daughters in order to find capable sons-in-law (in terms of running the farm household and providing labor) might find a contemporary equivalent. Mehrotra *et al.* (2010) found that the practice of adopting adults, even if one had biological children, made family firms unusually competitive in post-war Japan. Adoption thus might provide a venue to consider not only

the continuity of family line but also success in family business that gave a boost to economic development of early modern Japan. Further analysis of adoption in relation to other household events and demographic patterns should reveal various options that peasant families utilized for better survival of individuals and families, continuity of households, and, in turn, to bring about social order of village organizations. As mentioned in the result section, this paper did not deal with the puzzle of increasing rates of adoption that went together with the improvement of reproduction. Such trends need to be discussed in relation to demographic and economic developments, as well as the availability of adaptable sons and daughters (supply side factor). The association between family system and economic development in early modern Japan was previously discussed by Wolf (1985), and it is currently placed under thorough scrutiny with modifications and clarifications (e.g. Sakane 2011; Saito 2011). Family system has a significant role in shaping both the lifecourse of individuals as well as the social and economic development of a society. As Saito once noted, adoption might be the best indicator of "wish to perpetuate the *ie*" (Saito 1998). That is, adoption may have been one of the important mediators of demographic constraints and perpetuation of *ie*, which, in turn, provided the basis for social and economic development on the eve of Japanese modernization.

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#### Notes

1) An earlier version of this paper was presented at the annual meeting of Population Association of Japan, Tokyo University, June 2-3, 2012 and IER Seminar at Hitotsubashi University, Japan, September 19, 2012. I would like to thank Profs. Osamu Saito, Chiaki Moriguchi, Ryo Kambayashi, and participants of the meetings for their constructive comments.

2) Wang and Lee (1998) found among imperial lineage members from 1700 to 1850 that many adopted sons were adopted in their infancy, half of all adopted sons were adopted at age five and above, 20 percent at age 20 and above, and five percent at 30 and above.

3) However, the effect of "period" on in-adoption was not significant in the event history analysis when other variables were controlled. Still, this point deserves further investigation with possible considera-

tions including (a) the variation in the proportion of sonless couples; (b) lag effects of reproduction and adoption; (c) increase in the number of adoptions due to the increase of divorce/disownment (i.e. couples adopted sons or sons-in-law multiple times); (d) change of adoption strategy.

4) For a better understanding, I plan to examine the supply side factor by including the variable to indicate availability of adaptable sons in the two villages in the future analysis.

#### References

- Bengtsson, Tommy, Cameron Campbell and James Lee *et al.* (2004) *Life Under Pressure: Mortality and Living Standard in Europe and Asia, 1700-1900*, Cambridge: MIT Press.
- Cornell, Laurel L. (1987) "Hajnal and the Household in Asia: A Comparativist History of the Family in Preindustrial Japan, 1600-1870," *Journal of Family History*, Vol. 12, No. 1, pp. 143-162.
- Goody, Jack (1969) "Adoption in Cross-Cultural Perspective," *Comparative Studies in Society and History*, Vol. 11, No. 1, pp. 55-79.
- Hanley, Susan (1985) "Family and Fertility in Four Tokugawa Villages," pp. 196-228 in Hanley, Susan B. and Arthur P. Wolf (eds.) *Family and Population in East Asian History*. Stanford: Stanford University Press.
- Kim, Kuentae and Hyunjoon Park (2010) "Family Succession through Adoption in the Chosun Dynasty," *The History of the Family*, Vol. 15, No. 4, pp. 443-452.
- Kinoshita, Futoshi (2002) *Kindaika izen no Nihon no jinko to Kazoku—Ushinawareta Sekai kara no Tegami* (Population and Family in Pre-Modern Japan: Letter from Forgotten World). Kyoto: Minerva.
- Koriyama-shi (1981) *Koriyama-shi 1&2: Kinsei, Jyo&Ge* (The history of Koriyama City 1&2: Early Modern Period). Tokyo: Kokkusho Kanko Kai.
- Kurosu, Satomi (2011) "Distribution of Land in Rural Communities in Northeastern Japan 1716-1870," paper presented at ESSHC, April, Ghent.
- Kurosu, Satomi (2010) "Divorce in Early Modern Rural Japan: Household and Individual Life Course in Northeastern Villages, 1716-1870," *Journal of Family History*, Vol. 36, No. 2, pp. 118-141.
- Kurosu, Satomi (2007) "Remarriage in a Stem Family System in Early Modern Japan," *Continuity and Change*, Vol. 22, No. 3, pp. 429-458.
- Kurosu, Satomi (1996) "Leaving Home in a Stem Family System: Departures of Heirs and Non-Heirs," *The History of the Family: An International Quarterly*, Vol. 1, No. 3, pp. 329-352.
- Kurosu, Satomi and Emiko Ochiai (1995) "Adoption as an Heirship Strategy under Demographic Constraints: A Case from Nineteenth-Century Japan," *Journal of Family History*, Vol. 30, No. 3, pp. 261-288.
- Kurosu, Satomi, Noriko O. Tsuya and Kiyoshi Hamano (1999) "Regional Differentials in the Patterns of First Marriage in the Latter Half of Tokugawa Japan," *Keio Economic Studies*, Vol. 36, No. 1, pp. 13-38.
- Lee, James and Feng Wang (1999) *One Quarter of Humanity: Malthusian Mythology and Chinese Realities, 1700-2000*, Cambridge, Mass.: Harvard University Press.
- Mehrotra, Vikas, Randall Moreck, Jungwook Shim and

- Yupana Wiwattanakantang (2010) "Adoptive Expectations: Rising Sons in Japanese Family Firms," NBER Working Paper Series 16874, National Bureau of Economic Research.
- Moriguchi, Chiaki (2010) "Child Adoption in Japan, 1948-2008: A Comparative Historical Analysis," *Economic Review*, Vol. 61, No. 4, pp. 342-357.
- Nagata, Mary Louise, Satomi Kurosu and Akira Hayami (1998) "Shimomoriya and Niita of the Nihonmatsu Domain in the Northeastern Region of Tokugawa Japan," Eurasian Project on Population and Family History Working Paper Series, No. 20, Kyoto: International Research Center for Japanese Studies.
- Nakane, Chie (1967) *Kinship and Economic Organization in rural Japan*. London: The Athlone Press.
- Narimatsu, Saeko (1985) *Kinsei Tohoku Noson no Hitobito: Oshu Asaka-gun Shimomoriya-mura* (People in a Northeastern Agricultural Village in Early Modern Japan: The Village of Shimomoriya, Asaka Country, Ou Region). Kyoto: Mineruva Shobo.
- Narimatsu, Saeko (1992) *Edo-jidai no Tohoku Noson: Nihonmatsu-han Niita-mura* (An Agricultural Village in the Edo Period: Niita in the Nihonmatsu Domain). Tokyo: Dobunkan.
- Okada, Aoi and Satomi Kurosu (1998) "Succession and the Death of the Household Head in Early Modern Japan: A Case from a Northeastern Village, 1720-1870," *Continuity and Change*, Vol. 13, No. 1, pp. 143-166.
- Otake, Hideo (1988) "Hokonin niokeru Oyakogisei (Fictional relationships of parent and child among servants)," pp. 99-131 in Otake Hideo, Takeda Wataru, and Hasegawa Yoshikazu (eds.) *Giseisar-eta Oyako* (Fictional Relationships of Parent and Child). Tokyo: Sanseido.
- Oto, Osamu (1996) *Kinsei Nomin to Ie-Mura-Kokka* (Peasants in early Modern Japan and Family-Village-Nation). Tokyo: Yoshikawa Kobunkan.
- Sakane, Yoshihiro (2011) *Nihon Dento Shakai to Keizai Hatten* (Traditional Japanese Society and Economic Development). Tokyo: Nosan-gyoson Bunka Kyokai.
- Saito, Osamu (1998) "Two Kinds of Stem-Family System? Traditional Japan and Europe Compared," *Continuity and Change*, Vol. 13, No. 13, pp. 167-186.
- Saito, Osamu (2011) "The Stem Family and Labour Markets: Reflections on Households and Firms in Japan's Economic Development," Special Issue: Marriage Patterns, Household Formation and Economic Development, *The History of the Family*, Vol. 16, No. 4, pp. 466-480.
- Saito Osamu (2010) "Climate and Famine in Historic Japan: A Very Long-Term Perspective," pp. 271-281 in Kurosu, Satomi, Tommy Bengtsson, and Cameron Campbell (eds.) *Demographic Responses to Economic and Environmental Crises*. Reitaku University.
- Saito, Osamu (2000) "Marriage, Family Labour and the Stem Family Household: Traditional Japan in a Comparative Perspective," *Continuity and Change*, Vol. 15, No. 1, pp. 17-45.
- Skinner, G. William (1988) "Reproductive Strategies, the Domestic Cycle and Fertility among Japanese Villagers, 1717-1869," Paper presented to the Rockefeller Foundation Workshop on Women's Status in Relation to Fertility and Mortality, Bellagio, Italy, June 6-10.
- Takeda, Wataru (1988) "Yoshi no Gainen to Mokuteki: Yoshi Kenkyu no Sokatsu wo Megutte (Concept and Purpose of Adoption: A Comparative Understanding of Studies in Adoption)," pp. 301-322 in Otake Hideo, Wataru Takeda, and Yoshikazu Hasegawa (eds.) *Giseisar-eta Oyako* (Fictional Relationship of Parent and Child). Tokyo: Sanseido.
- Takeuchi, Toshimi (1969) *Kazoku Kanko to Ie Seido* (Family Practice and the Ie System). Tokyo: Koseishakoseikaku.
- Tsuya, Noriko O., Cameron Campbell and Wang Feng (2010) "Reproduction: Models and Sources," pp. 39-64 in Tsuya, Noriko O., Wang Feng, George Alter, James Z. Lee, et al. *Prudence and Pressure: Reproduction and Human Agency in Europe and Asia, 1700-1900*. Cambridge: MIT Press.
- Tsuya, Noriko O. and Satomi Kurosu (2010) "Family, Household, and Reproduction in Northeastern Japan, 1716-1870," in *Prudence and Pressure: Reproduction and Human Agency in Europe and Asia, 1700-1900*, Noriko O. Tsuya, Wang Feng, George Alter, James Z. Lee, et al. Cambridge: MIT Press, pp. 249-285.
- Tsuya, Noriko O. and Satomi Kurosu (2004) "Mortality and Household in Two Ou Villages, 1716-1870," in *Life Under Pressure: Mortality and Living Standard in Europe and Asia, 1700-1900*, Tommy Bengtsson, Cameron Campbell, James Lee, et al. Cambridge: MIT Press, pp. 253-292.
- Tsuya, Noriko O. and Satomi Kurosu (2000) "Economic and Household Covariates of First Marriage in Early Modern Japan: Evidence From Two Northeastern Villages, 1716-1870," in *Family Structure, Demography and Population: A Comparison of Societies in Asia and Europe*, edited by Catharine Caplone, and Muriel Neven. Liege: Laboratoire de Demographie de l'Universite de Liege, pp. 131-157.
- Tsuya, Noriko O., Wang Feng, George Alter, James Z. Lee, et al. (2010) *Prudence and Pressure: Reproduction and Human Agency in Europe and Asia, 1700-1900*. Cambridge: MIT Press.
- Ueno, Kazuo (1988) "Higashi Asia ni okeru Yoshi no Hikakukenkyu (A comparative study of adoption in East Asia)," pp. 181-205 in Otake Hideo, Wataru Takeda, and Yoshikazu Hasegawa (eds.) *Giseisar-eta Oyako* (Fictional Relationship of Parent and Child). Tokyo: Sanseido.
- Wang, Feng, and James Lee (1998) "Adoption among the Qing Nobility and Its Implications for Chinese Demographic Behavior," *History of the Family*, Vol. 3, No. 4, pp. 411-427.
- Wolf, Arthur, P. and Susan Hanley (1985) "Introduction," in Hanley, Susan and Arthur P. Wolf (eds.), *Family and Population in East Asian History*. Stanford: Stanford University Press.
- Wolf, Arthur, P. and Chieh-shang Huang (1980) *Marriage and Adoption in China, 1845-1945*. Stanford: Stanford University Press.
- Wrigley, E. A. (1978) "Fertility Strategy for the Individual and the Group," pp. 135-154 in Tilly, Charles (ed.) *Historical Studies of Changing Fertility*. Princeton: Princeton University Press.
- Yasuzawa, Shuichi (1972) *Kinsei Sonraku Keisei no Kisokozo* (A Fundamental Structure of Early Modern Villages). Tokyo: Yoshikawa Kobunkan.