Coresidence with Parents and a Wife's Decision to Work in Japan

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Abstract

The purpose of this paper is to analyze the factors that would affect the married couple's decision to coreside with their parents and a wife's decision to work in Japan, explicitly considering the simultaneous structure of these two decisions. Unlike preceding studies, we distinguish coresidence with the husband's parents and that with the wife's parents. Our empirical analysis based on the micro-data shows that the positive impact of coresidence with parents on the wife's labor participation tends to be underestimated, unless simultaneous decisions are taken into account. It is also found that the couple's decision to coreside with their parents is influenced by socio-economic and demographic factors such as the couple's educational attainments as well as the family relations.

Key words: coresidence, Japan, a wife's labor participation

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INTRODUCTION

In Japan, it remains a challenge for wives to juggle work and family. The labor participation ratio of women by age is still clearly M-shaped, with two peaks in the twenties and the forties, reflecting the fact that they tend to leave the labor market after giving birth to a child and to return to the market after their children grow up. The base of the "M" has become shallower in recent years, but this is largely due to increases in unmarried working women in their thirties. If we focus on married women in this age group, the ratio of working women was 49 percent in 2003, almost the same level as thirty years before (Statistics Bureau, 2003).

Meanwhile, it is widely known that the ratio of working wives is noticeably high in three-generation households in Japan, because of two reasons. First, there is a chronic shortage of licensed daycare centers for children and out-of-school hours care centers. As of March 2003, only 29 percent of preschoolers (2,030,000 children) were registered at daycare centers, and children on waiting lists for daycare centers exceeded 26,000 mainly in large cities. Second, the husband tends to work such long hours that he cannot contribute much to housework. In fact, about three-fifths of Japanese men work over 43 hours, two-fifths work 49 hours or more, and one-fifth over 60 hours per week (OECD, 2003).

Under these circumstances, living with parents and thus reducing the burdens of child rearing and housekeeping are an attractive option, especially for working wives. In fact, three-generation households accounted for 11 percent of all households and 25 percent of households with children in 2001, suggesting that cooperation among family members plays an important role in Japan (Ministry of Health, Labour and Welfare, 2001).

Preceding studies in Japan have treated coresidence with parents as exogenous to a wife's labor participation. For example, Nagase (1997), Nakamura and Ueda (1999),

and Shigeno and Ohkusa (1999) found that coresidence with parents significantly raises the probability of wife's labor participation. On the other hand, Hayashi (1997) reported that the probability of coresidence with parents tends to be higher for working wives. However, the results of these studies could be biased, since the wife's propensities to coreside with parents and to participate in labor force are jointly determined. In fact, there is a growing literature that focuses on the endogeneity of labor supply and provision of informal care of one's parents through coresidence. Wolf and Soldo (1994), who used 1987 National Survey of Families and Households, analyzed the simultaneous decision of the wife's labor participation and informal care-giving for parents, although they did not explicitly analyze the choice of coresidence with parents. Ettner (1996) analyzed the simultaneous decision of the choice among three options (coresidence with parents for informal care-giving; informal care-giving without coresidence with parents; or no provision of informal care) and work hours of men and women. Pezzin and Schone (1999) estimated a joint model of informal care-giving, labor force participation, and cash transfer decisions of adult children who have a frail elderly parent.

Inspired by these studies, Sasaki (2002) conducted an exceptional analysis paying attention to the simultaneous decision of coresidence with parents and the wife's labor participation in Japan. Using data of 970 married women aged 24 to 34 from the Panel Study on Consumption and Living 1993, he found that, even after controlling for endogeneity biases, coresidence with parents has a significantly positive impact on labor participation of married women. As in the case of most existing studies in the U.S. and Japan, however, he did not distinguish between coresidence with the husband's parents and that with the wife's parents.

For the married couple, the cost and benefit of coresidence with the husband's

parents seem to greatly differ from those of coresidence with the wife's parents. The most typical cost of coresidence is the loss of the couple's privacy. For example, the wife's assessment of loss of privacy when she lives with her husband's mother seems to be different from the case where she lives with her own mother. For the parents, too, the cost and benefit of living with their son and his wife must differ from those of coresidence with their daughter and her husband. It has been said that most parents prefer care-giving from their own daughter to that from their son's wife (Martin and Tsuya, 1991). Actually, Wolf and Soldo (1994) analyzed the care-giving behavior of married women and reported that the probability that these women give informal care to their own parents is twice that compared to care-giving to their husband's parents.

Partly affected by the Confucian norm, the three-generation households in Japan have traditionally taken the form of coresidence of parents with their eldest son's family in most cases. However, lower birth rates in the past several decades are causing changes in the patterns of coresidence. At present, those in their twenties and thirties, who are at the family formation stage, have one brother or sister at most, and there are often marriages between an eldest son and an eldest daughter. As a result, it seems to have become more important than in the past to determine whether they would live with the husband's or the wife's parents, or would not live with parents when the couple choose their lifestyle.

Oishi and Oshio (2001) and Yokoyama (2002) made pioneering studies that paid attention to differences between coresidence with the husband's parents and that with the wife's parents. However, Yokoyama (2002) gave no consideration to the simultaneous decision of coresidence and the wife's labor participation. Oishi and Oshio (2001), who used the Tenth National Fertility Survey conducted in 1992, did take account of simultaneous decision. However, their empirical analysis had a problem:

the multinomial logit model of the choice of living arrangements (coresidence with the husband's parents, coresidence with the wife's parents, and noncoresidence with either parents) did not have the properties of independence from irrelevant alternatives (referred to as IIA thereafter).

This paper extends the model proposed by Oishi and Oshio (2001) and analyzes the factors that would determine the coresidence with parents and a wife's labor participation, based on more recent data of wider coverage. First, we present a simple theoretical model, which illustrates the couple's simultaneous decision making. Next, we discuss the econometric specification and report summary statistics of the 12th National Fertility Survey, on which our empirical analysis is based. Third, we summarize the estimation results and examine the quality of instrumental variables. The last section provides a summary of the main findings and concluding remarks.

THEORETICAL ANALYSIS

This section illustrates the simultaneous structure of the married couple's decision to coreside with their parents and a wife's decision to work, based on a very simplified model. We assume that leadership in selecting coresidence is taken by the married couple rather than by their parents, unlike in the case of the bargaining models presented by Kotlikoff and Morris (1990), since we cannot get information about the attributes of parents from the data enough to apply those models directly in Japan.

We denote the husband's income as y, the wife's working hours as l, and her hours of housework as h. We assume for simplicity that the wife's working hours and hours of housework are fixed. We normalize the total time available for the wife as one, and thus the wife's leisure time is equal to $1-l-h$ if she works and $1-h$ otherwise. The wife's wage rate per hour, w, is given exogenously.

The couple's utility is determined by their income (expenditure) and by the wife's leisure time. We first discuss the case where no distinction is made between coresidence with the husband's parents and that with the wife's parents, focusing on four elements for choices: noncoresidence with parents (*S*), coresidence with them (*C*), the wife's labor participation (*W*), and the wife taking no job (*N*). Then, the lifestyle options the couple can choose are expressed as (*S*, *W*), (*S*, *N*), (*C*, *W*), or (*C*, *N*). The couple's utility *U* is determined by one of these four alternatives.

Now, we express utility for the case where the couple do not live with parents and the wife works by *U* (*S*, *W*) and for the case where they do not live with parents and the wife does not work by *U*(*S*, *N*). We express the weight of income and spare time in assessing utility by α (>0) and β (>0), respectively, and set up the utility functions for each case such as:

$$U(S,W) = \alpha \ln(y + wl) + \beta \ln(1 - l - h),$$
$$U(S,N) = \alpha \ln(y) + \beta \ln(1 - h).$$

We also assume that the parents take charge of all housework if the couple choose to live with them, thus freeing the wife from housework completely. At the same time, coresidence with parents is accompanied by psychological burdens on the part of the couple, reducing their utility to that extent. We express the case where the couple live with parents by *U*(*C*,*W*) and the wife takes a job and the case where they coreside with parents and the wife does not work by *U*(*C*, *N*). *U*(*C*,*W*) and *U*(*C*, *N*) are expressed by:

$$U(C,W) = \alpha \ln(y + wl) + \beta \ln(1 - l) - \gamma,$$
$$U(C,N) = \alpha \ln(y) + \beta \ln 1 - \gamma = \alpha \ln(y) - \gamma,$$

respectively, where γ is a parameter that represents a reduction in the utility due to coresidence with parents. If coresidence with parents makes the couple feel a larger loss of privacy or intensifies discord between the husband's mother and wife for

instance, the value of γ will become higher. By contrast, if the couple are happy with coresidence with parents, γ may have a negative value. The value of γ depends on the various social and economic attributes of the couple and their parents.

Then, we can confirm that the lifestyle choice by the couple depends heavily on the husband's income and coresidence-caused psychological burdens. We assume both α and β to be equal to one to simplify the calculation, since the subsequent discussion is basically unaffected even if their values differs from one. The order of preferences of the four lifestyles is thus determined by the following six ($=_4C_2$) simultaneous inequalities::

$$
\begin{aligned}
&U(S,W) > (\leq) U(S,N) \Leftrightarrow y < (\geq)(1-l-h)w,\\
&U(C,W) > (\leq) U(C,N) \Leftrightarrow y < (\geq)(1-l)w,\\
&U(S,W) > (\leq) U(C,W) \Leftrightarrow \exp(-\gamma) < (\geq)(1-l-h)/(1-l),\\
&U(S,N) > (\leq) U(C,N) \Leftrightarrow \exp(-\gamma) < (\geq)1-h,\\
&U(S,N) > (\leq) U(C,N) \Leftrightarrow \exp(-\gamma) < (1-l-h)(y+wl)/y,\\
&U(S,N) > (\leq) U(C,W) \Leftrightarrow \exp(-\gamma) < (1-h)y/[(1-l)(y+wl)].
\end{aligned}
$$

Some comments can be made on this system of six inequalities. First, the first and second inequalities suggest that with the coresidence decision given, the lower the husband's income is, the higher the wife's labor participation rate will become. Second, the third and fourth inequalities suggest that with the wife's decision to take a job given, the psychological burdens of coresidence becomes higher—i.e., the value of $\exp(-\gamma)$ is smaller—the ratio of choice of coresidence with parents will be lower. Finally, the fifth and sixth inequalities imply that the combination of the husband's income and coresidence-caused psychological burdens allows us to determine the order of preference as to the lifestyles for which a direct comparison is difficult. For example, we can compare (a) living apart from parents and the wife's labor participation and (b) coresidence with parents and the wife taking no job, or compare (c) living apart

from parents and the wife not working and (d) coresidence with parents and the wife's labor participation.

Figure 1 illustrates the simultaneous decision of the couple' coresidence with their parents and the wife's labor force participation. It shows how the combination of the husband's income (horizontal axis) and coresidence-based psychological burdens (vertical axis) determines the lifestyle of the couple, solving the above-mentioned six inequalities (note that the higher value of $\exp(-\gamma)$ means the less psychological burdens on the vertical axis). As clearly seen from this figure, the higher the husband's income is, the less often the wife takes a job; and the heavier the psychological burdens of coresidence are, the more the couple tend to choose not to coreside with parents. In addition, because we know:

$$[U(S,W)-U(S,N)]-[U(C,W)-U(C,N)]=\alpha\beta\ln\frac{1-l-h}{(1-h)(1-l)}<0,$$

the wife's choice of taking a job has less effect on the couple's utility when they live separately from their parents than when they live with them.

What effect will the above outcome have when hours spent for housework *h* change? For example, the value of *h* will be greater if the couple have to spend more time for childbirth and child-care, and it will be smaller before they have a child or after they no longer have to care for their children. Let us consider an extreme case where the value of *h* is zero. In this case, the six inequalities can be simplified to:

$$\begin{aligned}
&U(S,W)>(\le)U(S,N)\Leftrightarrow y<(\ge)(1-l)w,\\
&U(C,W)>(\le)U(C,N)\Leftrightarrow y<(\ge)(1-l)w,\\
&U(S,W)>(\le)U(C,W)\Leftrightarrow \exp(-\gamma)<(\ge)1,\\
&U(S,N)>(\le)U(C,N)\Leftrightarrow \exp(-\gamma)<(\ge)1,\\
&U(S,N)>(\le)U(C,N)\Leftrightarrow \exp(-\gamma)<(1-l)(y+wl)/y,\\
&U(S,N)>(\le)U(C,W)\Leftrightarrow \exp(-\gamma)<y/[(1-l)(y+wl)].
\end{aligned}$$

Therefore, the couple's lifestyle choice can also be shown simply as illustrated in **Figure 2**. This figure underlines that, if *h* is zero, the couple will select to coreside or not to coreside and the wife's labor participation independently of each other. This indicates that the time needed for housework affects substantially the simultaneous determination of selecting coresidence with parents and a wife taking a job. Moreover, assuming the probability of choosing one of the four lifestyles corresponds to the area of each option shown in the figure (remembering that the density is not uniform), a comparison between Figure 2 and Figure 1 suggests that the shorter the time taken for housework is, the less likely to coreside with the parents is selected and the higher the rate of the wife's labor participation becomes. This result makes sense intuitively and agrees with the results of preceding studies.

The ideas of the model described here are basically applicable to the case where coresidence with the husband's parents and coresidence with the wife's parents are distinguished. For example, assume an extreme case where the couple can entrust all the housework to the parents with whom they live, whether they are the parents of the husband or the wife. Then, the difference between coresidence with the husband's parents and coresidence with the wife's parents will only be the degree of the psychological burden due to coresidence. Thus, let us express coresidence with the husband's parents and coresidence with the wife's parents as C_1 and C_2, and the couple's utility reduced by psychological burdens as γ_1 and γ_2, respectively. If so, the couple's choice of coresidence with the husband's parents or coresidence with the wife's parents will be ultimately made by comparing the utility the couple get from each of the options.

Based on the above assumptions, the couple's utility of coresidence with parents when the wife works and when she does not can be expressed by:

$$U(C_1, W) = \alpha \ln(y_0 + wl) + \beta \ln(1 - l) - \gamma_1,$$
$$U(C_2, W) = \alpha \ln(y_0 + wl) + \beta \ln(1 - l) - \gamma_2,$$
$$U(C_1, N) = \alpha \ln(y_0) - \gamma_1,$$
$$U(C_2, N) = \alpha \ln(y_0) - \gamma_2$$

Therefore, there can be six cases in total, together with other two cases where the couple choose not to coreside and the wife works (*S, W*) and where they choose not to coreside and the wife does not work (*S, N*). The couple choose the option that would maximize their utility among these six lifestyles. There are as many as 15 ($=_6C_2$) inequalities to be examined when making the choice, and the classification of cases is complicated, but the framework of decision-making is the same in principle as that stated above.

In addition, the degree to which the couple can entrust their housework to the parents when they live with the husband's parents may differ from that when they coreside with the wife's parents. In the framework of the model mentioned above, the size of *h* differs according to with whom the couple live, the husband's parents or the wife's parents. It is troublesome but theoretically possible to reflect these factors on the model.

METHODOLOGY OF EMPIRICAL ANALYSIS

This and subsequent sections discusses, with the model described in the previous section in mind, the methodology and data to grasp the effects of coresidence with parents on the wife's labor participation, considering simultaneous determination of these two elements. In the discussion, we distinguish between coresidence with the husband's parents and coresidence with the wife's parents, in contrast to preceding studies that did not make such a distinction.

If we assume, as in preceding studies, that the wife's labor supply and the couple's decision to coreside with parents are decided independently of each other, the

wife's decision to participate is represented by a probit such that

$$p^* = \alpha_1' Z + \beta_1' X + e_1; \quad p = 1 \ \ if \ \ p^* > 0, \quad p = 0 \ if \ \ p^* \le 0, \tag{1}$$

where p^* is the latent variable of being employed relative to not being employed, Z is a vector of the dummy variables which represent the couple's living arrangements, X is a vector of individual and household characteristics that affect participation, α_1' and β_1' are coefficients to estimate and e_1 is a random error independently and identically distributed normal across individuals.

In the case where the wife's labor participation and the couple's coresidence with parents are jointly determined, then probit estimates of (1) will suffer from endogeneity bias. Hence, we employ the method proposed by Dubin and McFadden (1984) to deal with the potential endogeneity. Following Norton and Staiger (1994) and Ettner (1995, 1996), who actually applied this method, we first estimate the reduced form of a multinomial logit model (referred to as MNL thereafter) of residential choice, using all exogenous variables that affect labor participation and coresidence with parents. Then we construct predicted probabilities using the MNL results and estimate linear probability model for each type of living arrangements, including the predicted probabilities from the MNL model as instruments. This procedure is required because predicted probability from a nonlinear model is not guaranteed to be consistent under the usual instrumental variable assumptions (Ettner, 1995). Finally, we estimate Equation (1) replacing Z with the linearly predicted probabilities. The asymptotic standard errors are adjusted for the use of predicted values as in Lee (1981).

DATA

Our empirical analysis are based on the micro data from the "Twelfth Japanese National Fertility Survey in 2002, Part I: Survey on Married Couples" (referred to as the "NFS12" hereafter) conducted in 2002 by the National Institute of Population and Social Security Research. The survey covered married couples with the wife aged below 50, who lived in areas chosen by a two-stage systematic sampling of all the census enumeration districts in Japan in 2000, and the respondents were the wives of the sampled couples. The information available from the survey include the basic attributes of both the husband and the wife (such as date of birth, year of marriage, academic background, occupation, working hours, income class), as well as experience of pregnancy and childbirth, the number of children the couple want to have, the number of siblings, coresidence with parents.

The samples used for the estimation in this paper are the 4,981 couples with the wife aged 25 or above at the survey time. Couples with either the husband or the wife or both having remarried are excluded, because the behavior of these couples toward coresidence with the parents and the wife's attitude toward labor participation might differ from those of couples with both husband and wife married for the first time. Couples with the husband who has no regular employment, or is self-employed or unemployed are also excluded. In addition, samples with both the husband's and the wife's parents deceased are excluded. Iwamoto and Fukui (2001) pointed out that the analysis of the couples' coresidence choice often fails to check whether their parents were alive or not, but our analysis is completely free from this criticism.

We use the reported answers to the question about "coresidence with parents at present" of NFS12 as a variable for the state of coresidence with parents. The respondents (wives) were asked to reply to this question by choosing one from five

choices for their own father and mother and for their husband's father and mother, respectively: (a) living together; (b) living apart on the same lot of land; (c) living apart in the same municipality; (d) living apart in another area; and (e) deceased. In this paper, (a) is regarded as coresidence. **Table 1** summarizes the cross distribution of the residential state and the wife's labor participation. We can confirm from this table that the rate of labor participation of a wife who lives with parents is higher than that of a wife living apart from parents.

The husband's income and the wife's wage rate are structural factors that determine the couple's lifestyle, as suggested by the model discussed in the previous section. Our empirical analysis uses the logarithmic value of the husband's annual income in the previous year obtained from the NFS12. However, the NFS12 does not give sufficient information about the wife's wage rate. Thus, we use the dummy variables that represent the wife's age, educational attainment, as well as the unemployment rate in the residential area, all of which are supposed to affect the wage rate.

We also include dummy variables that present whether the wife continued working as a regular employee from the time of graduation from school until she decided to marry. In Japan, only work experience as a regular worker can affect the market wage, and experience as a part-timer or other irregular worker is not highly valued in most cases (Osawa, 1993; Nagase, 1997). Traditionally, most Japanese women are employed as regular employees after they graduate from school, and leave the labor market after they marry or give birth to a child. After their children grow up, they reenter the labor market as part-timers or contingent workers. However, since the mid 1990s, an increasing number of newly graduated women have been unable to get regular employment to a worsening employment situation. Therefore, women who

continued to work as regular workers after graduating from school until marriage are considered to have high-quality human capital and are likely to be paid high wages.

We consider another couple of factors that would affect the wife's labor participation. First, we check whether the couple have any child, and use dummy variables for three age groups, 0 - 2, 3 - 6, and 7 - 12 years, for their child(ren). This is because the shorter the time needed for childcare and housework is, the higher the wife's propensity to work is expected to be, as explained in the theoretical model. Second, we check whether the couple live in a densely inhabited district. Third, we calculate for each prefecture the capacity ratio of licensed daycare centers, which is defined as the percent rate of the capacity of licensed daycare centers to the number of preschoolers in the prefecture, and use it as an explanatory variable. The data on the capacity of licensed daycare centers are obtained from the "Survey on Social Welfare Institutions", which was conducted by the Ministry of Health, Labor, and Welfare, and those of the number of preschoolers from the "Population Estimates", which was conducted by the Ministry of Public Management, Home Affairs, Posts and Telecommunications.

Coresidence with parents is also affected by the psychological burdens of coresidence, as suggested by Figures 1 and 2. We take the following variables as socioeconomic factors that influence these psychological burdens. The first ones are the husband's and the wife's ages and educational attainments, which are likely to affect the value they place on privacy. The second are dummy variables representing whether or not the husband and the wife lived with their own parents when they decided to marry. They are expected to reflect the "hysteresis": premarital living arrangement has on the coresidence choice after marriage. The third is a dummy variable representing an "arranged" marriage. In the case of an arranged marriage, unlike in a

love marriage, the couple are likely to have made pre-arrangements for their lifestyle after marriage, including the coresidence choice. The fourth is a dummy variable representing whether the couple's parents are alive or dead. If any of the parents is dead, the couple's psychological burdens will differ as to whether they live with or apart from the parent alive or live with the other parents. Fifth, we use a dummy variable representing that the husband or wife is the successor, based on the data on the birth order and sex of children provided by the NFS12. "Successor" here means the eldest son, or the eldest daughter that has no brothers. It is widely known that Japan has a strong social norm of the successor living with or taking care of his or her parents (Martin and Tsuya, 1991; Yokoyama, 2002), and the couple's attitude toward coresidence is likely to be highly influenced by this social norm.

Finally, we use the dummy variable representing type of residence, an owned detached house or an owned apartment. In Japan, owned houses have generally a larger living space than rented houses, and this is especially the case with owned detached houses. If the living space is small, it is more difficult to protect privacy and the psychological burdens of coresidence will be heavier.

Table 2 summarizes the explanatory variables used for the estimation and the basic statistic of each of these variables as classified by the residential state. The instrumental variables that explain the coresidence choice should influence that choice only and should have no direct effects on the decision of the wife's labor participation. Of the variables mentioned above, those adopted as the instrumental variable are: (a) the husband's attributes (age, educational attainment); (b) the hysteresis (the husband's and the wife's premarital living arrangements, whether their marriage was arranged or not); (c) whether the husband's and the wife's parents are alive or dead; (d) sibling relationship (whether the husband and the wife are successors or not); and (e) type of

residence (owned detached house or owned apartment). Whether these are appropriate as instrumental variables is discussed in the next section.

ESTIMATION RESULTS

Estimation results of the coresidence choice

Table 3 summarizes the estimation results using a reduced MNL model of the coresidence choice that assumes three options, coresidence with the husband's parent, coresidence with the wife's parent, and noncoresidence. To test misspecification, i.e., whether or not the independence from irrelevant alternatives (IIA) property holds, we compare the estimation results obtained from the constrained model that excludes one of the three options ($\hat{\beta}_R$) and those obtained from the full model with all of the three options ($\hat{\beta}_F$) (Hausman and McFadden, 1984). The test statistic, which is given by

$$H_{IIA} = (\hat{\beta}_R - \hat{\beta}_F)'[Var(\hat{\beta}_R) - Var(\hat{\beta}_F)]^{-1}(\hat{\beta}_R - \hat{\beta}_F)$$

is distributed as chi-squared with degrees of freedom equal to the rank of $[Var(\hat{\beta}_R) - Var(\hat{\beta}_F)]$ under the null hypothesis that the IIA holds. The test statistic is 34.98 for the case in which coresidence with the wife's parents is excluded, and 11.73 for the case in which coresidence with the husband's parents is excluded (the degree of freedom is 26 for both cases). Therefore, neither case rejects the null hypothesis of IIA (the critical value for chi-squared [26] = 38.88 with 5% significance level).

The above-mentioned sets of instruments (a) to (e) all have significant effects on the coresidence choice. It should be noted that, in many cases, those variables affect coresidence with the husband's parents and that with the wife's parents in different ways.

For each group, we find the following facts.

Husband's characteristics. The higher the husband's age is, the higher the probability of living with the husband's parents is, and the lower the probability of living with the wife's parents or of living apart from parents becomes. In addition, the more educated the husband is, the higher the probability of living apart from both the husband's parents and the wife's parents becomes. The comparison of the marginal effects shows, however, that the effect of avoiding coresidence with the husband's parents is greater.

Hysteresis. In the case in which the husband or the wife has resided with their parents until he or she marries, he or she tends to choose continued coresidence with his or her parents after marriage rather than living with the spouse's parents. In the case of arranged marriages, the possibility of coresidence with the wife's parents is significantly high. This may suggest that in an arranged marriage, so-called *iri-muko* (the practice of the man marrying into his wife's family) is often a precondition of looking for a candidate husband.

Parent status. If the husband's mother is dead, the probability of the couple living with the husband's father is significantly low. The couple cannot expect any advantage from living with parents of lightening their housework and child-care burdens. However, the other cases of the death of the father or the mother do not show any significant impact on the coresidence choice.

Sibling characteristics. The "successor" variable is remarkably significant for both the husband and the wife. Where the husband is the successor, the probability of

coresidence with the husband's parents is higher by 9.7 percent than in other cases, while that of living with the wife's parents is lower by 4.1 percent. Conversely, where the wife is the successor, the probability of coresidence with the wife's parents is higher by 8.7 percent than in other cases, whereas that of living with the husband's parents is lower by 1.5 percent. Sasaki (2002) also showed that the fact that the husband was the successor raises the possibility of coresidence, but he did not observe any significant change when the wife was the first daughter. This is probably because his analysis does not sufficiently control the wife's sibling relationship.

Current residence ownership. The type of residence significantly affects the decision on coresidence with parents. In particular, in the case of owned detached houses, the probability of coresidence with the husband's parents is 17.3 percent higher than in other cases, and that of coresidence with the wife's parents is 7.2 percent higher. In the case of owned apartments, the probability of living with the wife's parents is significantly higher, while that of living with the husband's parents is not.

Now, let us move to the variables that would affect the wife's decision on labor force participation. First, higher income of the husband discourages coresidence with the parents, and marginal effects are larger in the case of coresidence with the husband's parents than that with the wife's parents. Second, the more educated the wife is, the more the couple tends to avoid coresidence with the husband's parents, while there is no significant influence on coresidence with the wife's parents. Third, in large cities, there is a tendency not to live with the husband's parents, but the probability of coresidence with the wife's parents is significantly higher than in rural areas. Fourth, in an area with a high unemployment rate, there is a strong tendency to live apart from

parents. Fifth, in an area with good access to licensed daycare services, the probability of living with the husband's parents is significantly high, but no effects are observed on coresidence with the wife's parents. Daycare services for children and coresidence appear to have complimentary relations rather than alternative relations.

Then, we estimate the linear probability model for each of the three options—coresidence with the husband's parents, coresidence with the wife's parents and noncoresidence—including in instrumental variables the estimated values of each option obtained from the estimation results of the MNL model. This procedure aims to raise the consistency of the estimation of the structural functions for the wife's decision to work. We do not report the estimation results of the linear probability models to save space, but the coefficient of each estimated value obtained from the MNL model is not significantly different from one and is significantly different from zero. The other instrumental variables were all insignificant. Based on these estimation results of the linear probability model, we establish the instrumental variables of coresidence for each sample, and estimate the function for the wife's decision to work.

Estimation results of the wife's labor participation

Table 4 shows the estimation results of the wife's labor participation. The left side of the table presents the estimation results in the case where the coresidence state is assumed to be exogenous, as was done in preceding studies. These results show that both coresidence with the husband's parents and that with the wife's parents substantially raise the probability of the wife's labor participation. The magnitude of the effect is about 12 percent for coresidence with the husband's parents and about 7 percent for coresidence with the wife's parents. In comparison, the results using instrumental variables, which are shown on the right side of the table, report much

larger effects of raising the probability of the wife's labor participation: about 24 percent and 19 percent, respectively. The effect of coresidence with the wife's parents of increasing the wife's labor participation has a magnitude comparable to that of coresidence with the husband's parents if endogeneity is controlled.

For the other variables, the results are about in line with those of preceding studies; lower income of the husband, a higher educational attainment of the wife, no infant children, and better access to daycare services significantly promote the wife's labor participation. Also, a wife who continued to work as a regular employee after graduating from school until marriage has a higher probability of labor participation than a wife who did not by about 12 percent. The former group of women includes those who have continued to work after marriage and those who have left the labor market upon marriage; but, in both cases, they are supposed to be paid higher wages than other groups. The wife's age has the effect of significantly increasing the probability of her labor participation. This is probably because many wives return to the labor market after their children have grown up and because in the seniority system in Japan, the older an employee is, the higher the wage he or she is paid.

It is worthwhile to compare our estimation results to those in Sasaki (2002), who dealt with the issue close to our analysis. Most of all, we find that our estimation results show greater endogeneity biases than his. The first reason for this is a big difference in the framework of the analysis: while Sasaki did not distinguish between coresidence with the husband's parents and that with the wife's parents, this paper distinguishes the two cases from each other. Second, the age groups of the samples are different. Sasaki used women aged 25 to 34 years, not so many years after their marriage. Therefore, the ratio of women having children was low and the number of children they had was small. Children are major obstacles to a wife's labor

participation, and many couples decide to live with parents when they have a child in an attempt to reduce the childcare responsibilities. The NFS12 used in this paper is a nationwide survey which covers wider age groups, so it correctly grasps the effects of childcare responsibilities on the coresidence choice. Third, the survey period of the data used differs. While Sasaki used the 1993 data, the NFS12 used in this paper was conducted in 2002. The comparison between the NFS10 conducted in 1992 and the NFS12 points to more couples living together with the wife's parents, as the ratio of couples who lived with the wife's parents rose from 5.3 percent to 7.1 percent during the decade. Two factors appear to have caused this change. First, the younger the generation is, the less siblings they have, which has increased the women who are the successors. Second, female university graduates who started work in 1985, when the Equal Employment Opportunity Law was enacted, reached the age of childbearing and some of them chose to live with their parents to continue working.

Significance of the instrumental variables

Finally, let us examine the validity of the instrumental variables used in our empirical analysis. We compare the estimation results of the full model which includes all five instrument sets to those of the constrained models in which one of the instrument sets was excluded by turn. We conduct (a) likelihood ratio tests based on chi-square statistics for the MNL model and the probit model for the wife's decision to work and (b) Walt tests based on F-values for the linear probability models. We conduct these tests for each set of instruments, and summarize the results in **Table 5**. This table shows that all sets of instruments are very significant at the first stage of the MNL model. In the linear probability models, the predicted probabilities of from the MNL regressions are all very significant but other sets of the instruments are all insignificant.

In the probit model of the wife's decision to work, the hysteresis and sibling relations are still significant and their effectiveness as instruments is a little bit doubtful. However, the husband's attributes, the state of parents (alive or dead), and the type of residence are all insignificant, indicating that they are good instruments. Also, the estimated probabilities of the linear probability models are highly significant in the probit model of the wife's decision to work.

CONCLUSION

This paper has analyzed the effects of coresidence with parents on the wife's labor participation in Japan, explicitly considering the simultaneous structure of these two decisions and also distinguishing coresidence with the husband's parents and that with the wife's parents.

Our empirical analysis shows that the effect of coresidence of promoting the wife's labor participation tends to be underestimated unless the simultaneous structure of the determination is taken into account. More specifically, if the wife's labor participation and the coresidence choice are assumed to be determined independently of each other, coresidence with the husband's parents and with the wife's parents is estimated to raise the wife's labor participation by 12 percent and 7 percent, respectively. By contrast, in the model that explicitly takes account of the simultaneous determination, the figures turn to be as high as 24 percent and 19 percent, respectively. It suggests that coresidence with the parents encourages the wife to work more than implied by preceding studies.

We also find that a substantial influence of family relationship on the wife's labor market decision. The more educated the husband and/or the wife is, the more likely the couple live apart from the husband's parents. And there is a tendency of living

with the parents for whom either the husband or the wife is the successor, or with the parents with whom the husband or the wife lived before his or her marriage.

As noted, it is still not easy for Japanese women to cope with both work and family responsibilities. And the couple make decisions on the coresidence with their parents and the wife's labor force participation, by comparing the advantages (less family responsibilities) and disadvantages (less privacy) of coresidence. Our analysis confirmed that lower income of the husband, a higher educational attainment of the wife, no infant children, and better access to licensed daycare services significantly promote the wife's labor participation, all consistent with the results of prior studies.

We can also get some policy implications from the estimation results. The effect of good access to licensed daycare services of increasing the probability of the wife's labor participation suggests that the labor participation rate of women of childbearing age may be raised by expanding and improving daycare services for children. This is important in planning policies for coping with a decreasing labor force in the future. Meanwhile, the estimation results of the coresidence choice indicates that coresidence and daycare services have complimentary relations rather than alternative relations; for example, easier access to daycare services rather increases the probability of coresidence with the husband's parents. This suggests that it is difficult for the couple to juggle work and childcare without support from their parents, even if a licensed daycare center is available. Policies that reduce long working hours and make workplaces more family-friendly would promote employment opportunities for married women.

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Figure 1: Coresidence with Parents and a Wife's Decision to Work (h>0)

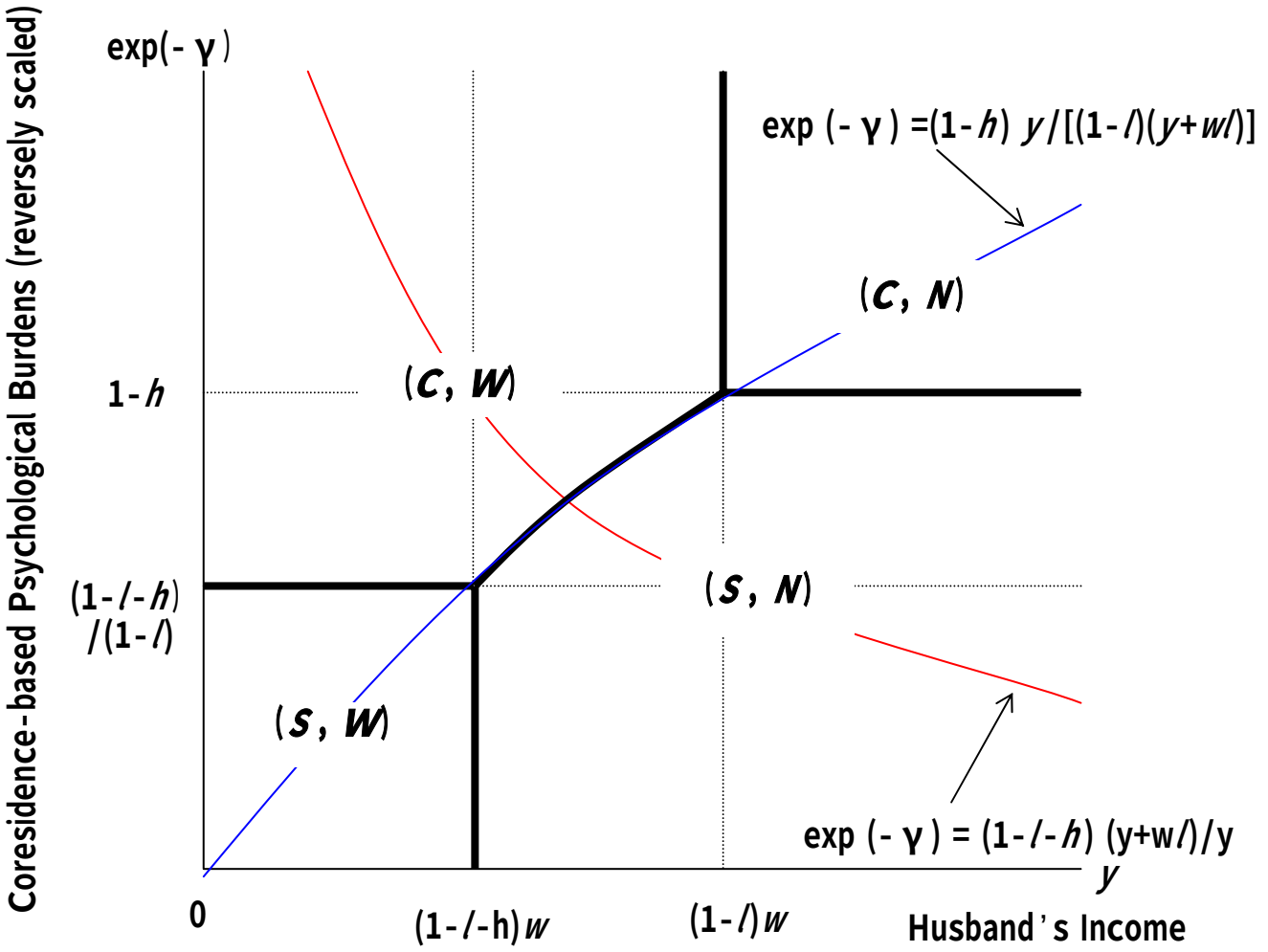

Figure 2: Coresidence with Parents and a Wife's Decision to Work (h=0)

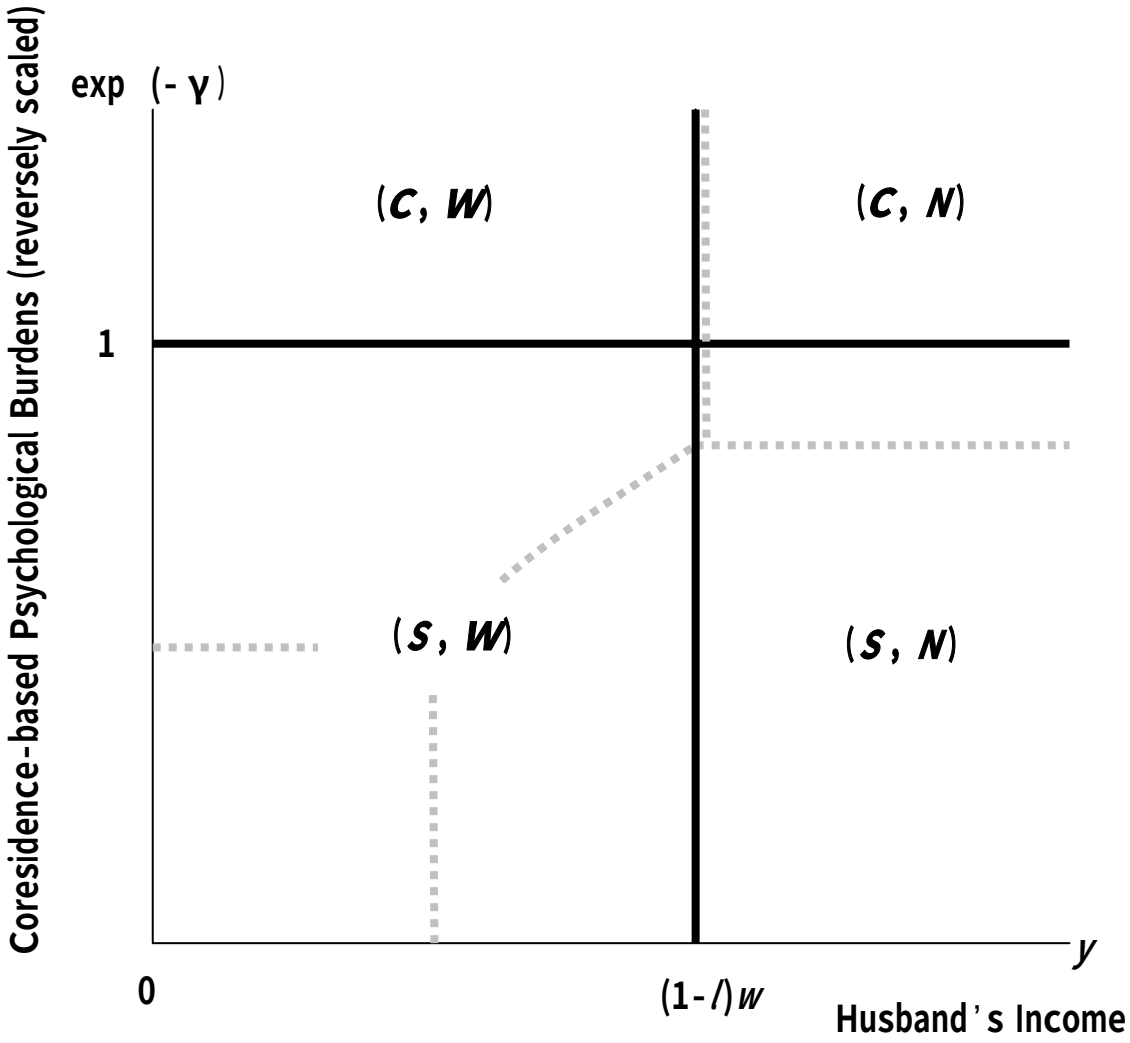

Table 1
Married Women's Work Status by Type of Coresidence with Parents

	Frequency			Percent		
Work status	Working	Not working	Total	Working	Not working	Total
Coresidence with husband's parents	603	282	885	68.1	31.9	100.0
Coresidence with wife's parents	233	127	360	64.7	35.3	100.0
Noncoresidence	1,915	1,821	3,736	51.3	48.7	100.0
All coresidence types	2,751	2,230	4,981	55.2	44.8	100.0

Table 2

Characteristics of the 12th NFS Respondent Couples by Type of Living Arrangement

	Noncoresidence	Coresidence with husband's	Coresidence with wife's
Wife's work status			
Working	51.3	68.1	64.7
Not working	48.7	31.9	35.3
Husband's income (thousand yen, in logarithm)	6.2	6.1	6.1
Wife's age	36.6	38.4	38.5
Wife's educational attainment			
High school or less	46.0	61.8	52.5
Junior college/vocational school	38.5	30.3	35.8
University or higher	15.5	7.9	11.7
Wife continued working as a regular employee before marriage	64.5	68.8	63.9
Presence of a child/children			
With children 0-2	24.8	19.7	16.9
With children 3-6	26.0	26.9	25.6
With children 7-12	30.8	40.3	35.6
Residence			
Densely inhabitated district (DID)	20.2	5.5	12.5
Non DID	79.8	94.5	87.5
Prefectural unemployment rate	5.03	4.74	4.90
Capacity ratio of licensed daycare centers	21.7	24.2	22.8
Husband's age	38.8	41.2	40.7
Husband's educational attainment			
Junior high school	1.3	2.7	2.5
High school	44.8	58.2	65.3
Technical junior college or university, or higher	53.9	39.1	32.2
Premarital living arrangements			
Husband lived with parents	37.3	78.2	33.6
Wife lived with parents	54.7	58.2	71.9
Arranged marriage	13.2	20.5	22.8
Parent's status			
Husband's father deceased	23.6	30.4	32.2
Husband's mother deceased	11.5	6.3	14.2
Wife's father deceased	19.4	22.1	21.1
Wife's mother deceased	7.1	6.8	7.5
Sibling characteristics			
Eldest son	60.5	89.3	32.8
Eldest daughter with no brothers	19.9	14.8	51.1
Residence ownership			
Owned detached house	48.7	95.9	89.7
Owned apartment house	9.6	0.8	3.1
N	3,736	885	360

Table 3
Multinomial Logit Estimation Results of Coresidence Choice

	Coresidence with husband's parents		Coresidence with wife's parents	
	Coef.	Marginal effects	Coef.	Marginal effects
Wife's age	0.00	0.000	0.05 **	0.002
Wife's educational attainment				
(*High school or less)*				
Junior college/vocational school	-0.38 ***	-0.022	0.11	0.005
University or higher	-0.55 ***	-0.028	0.15	0.006
Wife's premarital work experience				
(Didn't continue working as a regular employee)				
Continued working as a regular employee	0.05	0.003	-0.18	-0.006
Presence of a child/children				
(No children aged 0-12)				
With children 0-2	0.21	0.014	-0.33 *	-0.011
With children 3-6	0.04	0.003	0.03	0.001
With children 7-12	0.19 *	0.012	-0.07	-0.003
Residence				
(Non DID)				
DID	-0.46 **	-0.024	0.21 **	0.009
Prefe Prefectural unemployment rate	-0.12 **	-0.007	-0.06 *	-0.002
Capa Capacity ratio of lisenced daycare centers	0.02 ***	0.001	0.00	0.000
Husb Husband's age	0.04 ***	0.002	-0.05 **	-0.002
Husband's educational attainment				
(Junior high school)				
High school	-0.75 **	-0.044	-0.18	-0.004
Technical junior college, university or hig	-0.90 **	-0.052	-0.89 **	-0.028
Premarital living arrangements				
(Husband didn't live with his parent)				
Husband lived with his parent	1.68 ***	0.118	-0.66 ***	-0.025
(Wife didn't live with her parent)				
Wife lived with her parent	-0.40 ***	-0.027	0.98 ***	0.033
Type of marriage				
(Love marriage)				
Arranged marriage	0.15	0.008	0.38 **	0.014
Parent's status				
(Both parents alive)				
Husband's father deceased	0.17	0.010	0.18	0.006
Husband's mother deceased	-1.27 ***	-0.050	-0.02	0.001
Wife's father deceased	-0.09	-0.005	0.05	0.002
Wife's mother deceased	-0.19	-0.010	-0.05	-0.001
Sibling characteristics				
(Second- or later-born son/daughter, first-born daughter with brother(s))				
Eldest son	1.84 ***	0.097	-0.96 ***	-0.041
Eldest daughter with no brother	-0.17	-0.015	1.58 ***	0.087
Current residence ownership				
(Does not own current residence)				
Owned detached house	3.18 ***	0.173	2.60 ***	0.072
Owned apartment house	0.49	0.031	0.94 ***	0.044
Constant	-1.62 *		2.60 **	
N	4981			
Log likelihood	-2356.0			
Pseudo R^2	0.34			

Note: The base category is *noncoresidence* .
The omitted category for each dummy variable is shown in parentheses.
Marginal effects are reported as the change in the probability for an infinitesimal change in each independent, continuous variable. The marginal effect of a dummy variable (shown in italics) is calculated as the discrete change in the expected value of the dependent variable as the dummy variable changes from 0 to 1.
*p<.1. **p<.05. ***p<.01.

Table 4
Probit Estimation Results of Wife's Labor Participation

	Assuming exogeneity			IV		
	Coef.	Std. Err	Marginal effects	Coef.	Std. Err	Marginal effects
Coresidence with husband's parents	0.32 ***	0.05	0.122			
Coresidence with wife's parents	0.18 **	0.08	0.070			
Coresidence with husband's parents (IV)				0.61 ***	0.09	0.240
Coresidence with wife's parents (IV)				0.48 **	0.16	0.188
Husband's income (in logarithm)	-0.53 ***	0.05	-0.209	-0.49 ***	0.04	-0.193
Wife's age	0.02 ***	0.00	0.009	0.21 ***	0.00	0.008
Wife's educational attainment						
(*High school or less)*						
Junior college/vocational school	-0.06	0.04	-0.022	-0.04	0.03	-0.016
University or higher	0.14 **	0.06	0.056	0.16 ***	0.05	0.064
Wife's premarital work experience						
(Didn't continue working as a regular employee)						
Continued working as a regular employee	0.31 ***	0.04	0.124	0.31 ***	0.03	0.122
Presence of a child/children						
(No children aged 0-12)						
With children 0-2	-0.82 ***	0.05	-0.317	-0.82 ***	0.04	-0.317
With children 3-6	-0.47 ***	0.05	-0.185	-0.48 ***	0.04	-0.189
With children 7-12	-0.01	0.04	-0.004	-0.03	0.03	-0.010
Residence						
(Non DID)						
DID	-0.02	0.05	-0.009	0.01	0.04	0.003
Prefectural unemployment rate	-0.03	0.02	-0.014	-0.02	0.02	-0.009
Capacity ratio of lisenced daycare centers	0.01 ***	0.00	0.005	0.01 ***	0.00	0.004
Constant	2.51 ***	0.33		2.26 ***	0.25	
N	4981			4981		
Log likelihood	-2959.1			-2956.8		
Pseudo R2	0.14			0.14		

Note: The omitted category for each dummy variable is shown in parentheses.
Marginal effects are reported as the change in the probability for an infinitesimal change in each independent, continuous variable. The marginal effect of a dummy variable (shown in italics) is calculated as the discrete change in the expected value of the dependent variable as the dummy variable changes from 0 to 1.
*p<.1. **p<.05. ***p<.01.

Table 5
Tests for Significance of the Identifying Instruments

	MNL	Linear Probability			Probit (labor participation)
		Noncoresidence	Coresidence with husband's	Coresidence with wife's	
(a) Husband's characteristics	0.00 *44.48*	0.96 *0.09*	1.00 *0.00*	0.74 *0.42*	0.18 *4.96*
(b) Premarital living arrangements	0.00 *361.65*	0.91 *0.18*	1.00 *0.01*	0.54 *0.72*	0.00 *48.22*
(c) Parent status	0.00 *61.56*	1.00 *0.04*	1.00 *0.00*	1.00 *0.01*	0.94 *0.92*
(d) Sibling characteristics	0.00 *539.39*	0.84 *0.17*	0.98 *0.02*	0.07 *2.68*	0.00 *11.97*
(e) Current residence ownership	0.00 *678.49*	0.57 *0.56*	0.98 *0.02*	0.22 *1.52*	0.07 *5.37*
(f) MNL estimates					
Noncoresidence	-	0.00 *575.03*			-
Coresidence with husband's	-		0.00 *659.76*		0.02 *5.18*
Coresidence with wife's parents	-			0.00 *268.16*	0.00 *9.18*

Note: Variables included in each instrument set are: (a) husband's age, dummies indicating husband's educational attainment, (b) dummies indicating if the husband/wife lived with his/her parent before marriage, a dummy indicating arranged marriage, (c) dummies indicating if any of the couple's parents are alive or deceased, (d) a dummy indicating if the husband is the eldest son, a dummy indicating if the wife is the eldest daughter with no brother, (e) a dummy for owned detached house, a dummy for owned apartment house.
For each variable, figures in the first row show significance level and figures in the second row (shown in italics) indicate test statistics. Likelihood ratio tests are performed for multinomial and probit estimations, while Wald tests are performed for the linear probability estimations.