

# ***Female Labor Supply and Family Size Aspirations in Contemporary Japan***

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**NUPRI Research Paper Series No.59**

**December 1991**

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## ABSTRACT

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This paper examines the determinants of (i) labor force participation among married Japanese women of childbearing age and (ii) type of employment among those in the labor force, using nationwide micro-level survey data conducted in 1986. In view of the fact that Japan is the only developed society in which the three-generation household is commonplace, analyses have been focused upon the impacts of residential pattern and life cycle stage on female labor force participation and type of employment. After controlling for a host of demographic and socioeconomic variables related to female labor status, patrilocality of current residence has been observed to have a positive impact on labor force participation and an adverse effect on pursuit of part-time paid employment. The control factors in the labor force equations behave largely in the manner expected and in parallel with findings observed in other industrialized countries. An attempt has also been made to demonstrate that the labor force position of married women is related to their future fertility aspirations.

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## I. Introduction

Although the labor force participation rate (LFPR) for the aggregated data of all women has been rising sharply in many industrialized nations in recent decades, the overall LFPR among Japanese women aged 15 and over had fallen slightly from about 51 percent in the mid-1960s to a low of around 46 percent in the mid-1970s, after which it has been on an upward trend, reaching approximately 49 percent in 1988 (Statistics Bureau, 1989). This mildly U-shaped time path of the total LFPR of Japanese women is a composite of heterogeneous trends in different subgroups of the female population.

Since the mid-1960s, LFPR among 15-19-year-old women has been more than halved mainly due to the expansion of educational opportunities for women. LFPR of older women aged 60 and over has also been falling, though the decline seems to have slowed recently. Apparently, the enrichment of old-age pensions has contributed to this trend (Shimada and Higuchi, 1985). The rates for other age groups, however, show a declining trend until the mid-1970s and then reverse considerably. This reversal primarily reflects a compositional change in different categories of workers in recent years (Shimada and Higuchi, 1985). In the mid-1960s, nearly 20 percent of all Japanese women aged 15 and over were employed as family workers. By 1988, the figure had slipped in an almost monotonic decline to less than 9 percent. The relative number of women who were self-employed also fell during this period by 23 percent. In contrast, the relative number of women in paid employment rose almost as dramatically as the fractions in family work and self-employment dropped. In 1965, 24 percent of Japanese women aged 15 and over were paid employees; by 1988, the fraction had increased to 33 percent of women of working age (Statistics Bureau, 1989).

Despite these substantial intertemporal changes in the structure of employment opportunities, a sizeable fraction of Japanese women are still either self-employed or family workers. In 1988, nearly 15 percent of all Japanese women were in one of these two categories, a figure which amounts to slightly less than 30 percent of all women in the labor force. By way of contrast, in 1984, only 1 percent of the female labor force in the United States were family workers (Hill, 1989). Thus, in Japan, not only is the trend in total labor force

participation a composite of heterogeneous and contrary movements in different subgroups, but the work force itself remains quite heterogeneous with respect to type of employment.

It should also be stressed that the expansion of paid employment among Japanese women has certainly been rapid and significant. Shimada and Higuchi (1985) claim that it is one of the most drastic changes in female labor force participation in the recorded experiences of advanced economies. In virtually all the industrialized countries, the rise of paid employment has been associated with substantial decline in fertility. In the particular case of Japan, Ogawa and Mason (1986) have recently shown that an alternative specification of the Butz-Ward model (Butz and Ward, 1979), which includes the proportion of paid employees in the currently-married female population as an explanatory variable, tracks the course of the total fertility rate (TFR) in Japan quite satisfactorily between 1966 and 1984. Subsequent to the baby boom (1947-1949), Japan's fertility declined at an unprecedented rate. Over the period 1947-1957, TFR fell by over half from 4.53 to 2.04 children per woman. There was little change until the first oil crisis of 1973, when TFR started to fall again to 1.66 in 1988.

The age profile of female labor force participation, which is closely associated with the fertility pattern, is bimodal, reaching peaks at ages 20-29 and 40-49. Many women aged 20-29 are still unmarried or have yet to launch their families of procreation, and virtually all children for women aged 40-49 are beyond preschool ages. Consequently, one can plausibly argue that the operative variable generating the age profile of participation is not the age of a woman but her position in the family life cycle.

Recently married Japanese couples often initially take up residence in the household of the groom's parents. Couples who begin their marriage with neolocal residence may take in older parents later in their life cycle, particularly after the death of one parent. Thus, three-generation households are fairly common in Japan; in 1985, the proportion of three- or four-generation households was 19.7 percent, though it had been continuously declining from 36.5 percent in 1955 (Preston and Kono, 1988). The presence of older adults in the household often eliminates one of the barriers to female labor force participation, viz., the cost of child care. For women aged 35-49,

the estimated elasticity with respect to wages was six times greater for those in three-generation families than for those in two-generation families (Shimada and Higuchi, 1985); this is the expected pattern if women in three-generation families have greater flexibility in their decisions to enter the labor force.

In the remainder of this paper, we examine the labor force responses of married Japanese women who differ in their life cycle position and in their residential pattern, both with respect to participation per se and with respect to type of employment. We also investigate how and to what extent the labor force participation of married Japanese women affects their reproductive intentions in contemporary Japanese society. Section II briefly discusses the methodology and the data source used. Section III analyzes the pattern of labor force participation of married Japanese women as viewed in terms of their current living arrangements and their life cycle positions. Section IV examines statistical results with regard to the determinants of their labor force participation by type of employment. In Section V, an attempt is made to analyze the effect of their participation in the labor force upon their fertility aspirations. In the final section, the principal findings of the present study are summarized, and some of the policy implications are considered.

## II. Methodology and Data Source

A useful economic model for a married Japanese woman's decision to participate in the labor force and her choice between alternative types of employment if she participates is provided by Hill (1983 and 1989). In this model, a woman, faced with mutually exclusive choices between nonparticipation in the labor force and several different types of employment within it, compares the maximum utility attainable given each participation alternative and selects the alternative which yields the maximum maximorum (Hill, 1983). The appropriate statistical model in this case is the multinomial logit.

In the analyses of female labor participation and type of employment among labor force participants contained herein, the underlying model corresponds closely to that proposed by Hill. There is, however, one important difference. We choose to represent a woman's em-

ployment status as the outcome of a series of binary choices, which yield the same outcome as the single-comparison process described by Hill. Thus, we first analyze whether or not women are in or out of the labor force. A woman will decide to participate in the labor force if the maximum utility attainable by any form of labor force participation exceeds that attainable by nonparticipation. We then analyze, among labor force participants only, the decision to work as a part-time paid employee. A woman will opt to work part-time if the maximum utility attainable by pursuing part-time paid work exceeds that attainable under any other form of employment. Finally, for full-time workers, we examine the decision to enter the formal sector of full-time paid employment rather than the informal sector of self-employment or family work. Again, a woman enters full-time paid employment if it provides a maximum attainable utility which exceeds those available from alternative types of employment.

The end result of the hierarchical, binary decision-making process implicitly incorporated in the analyses of the present study is no different from the outcomes postulated in Hill's model. This formulation is preferable for purposes of exposition because it avoids the necessity of having to deal simultaneously with the factors affecting a multiplicity of outcomes. Statistically, of course, the representation is more complicated, since it requires estimation of several logit regressions rather than a single multinomial logit function. Obviously, one can retrieve from the analyses in this paper, the same probabilities which underlie Hill's multinomial logit approach. We, for example, do not study the probability that a women is engaged in full-time paid employment. Instead, we study the probabilities of labor force participation, of working at part-time paid employment conditional upon labor force participation, and of working at full-time paid employment given that one is not a part-time paid worker. Let E stand for full-time paid employment; F, for work in the informal sector or at full-time paid employment, and L, for labor force participation. Then, it follows from the elementary rules of probability theory that

$$P(E) = P(L)P(F|L)P(E|F), \text{ where evidently } P(E|F) = P(E|FL).$$

Rather than studying  $P(E)$ , we study  $P(L)$ ,  $1 - P(F|L)$ , and  $P(E|F)$ . Evidently, we can retrieve the  $P(E)$ 's from the probabilities we do study. This basic relationship still holds, of course, when all of the proba-

bilities are made conditional upon the same set of additional characteristics, which is what one effectively does in multivariate analysis. Thus, while the details differ, our basic approach is quite similar to that used by Hill. It should also be stressed that the substantive analyses of the present study differ from hers because we employ alternative predictor variables, focus on residential patterns and life cycle stages, and explicitly consider part-time employment. Many of these differences in substantive detail, however, are dictated by the contents of the respective data sets.

Since 1950, a series of sample surveys dealing with fertility and family planning have been undertaken by the Mainichi Newspapers of Japan. The present paper rests upon an analysis of the 18th round of these investigations, which was conducted in March of 1986. The data base for this survey is a sample of 2,574 currently married women of childbearing age. The present data were collected by distributing questionnaires to a target sample of 3,400 women. The completed questionnaires represent a response rate of 75.7 percent. Because many Japanese women are sensitive about discussing reproductive experiences and practices especially with strangers, the questionnaires were distributed to the sampled women, and retrieved a few days later by the trained survey personnel.

The representative target sample was selected using a stratified, multistage sampling procedure. Cities, towns, and villages throughout Japan were first stratified on the basis of population and local characteristics. Using Basic Resident Registers, respondents were then randomly chosen from each primary sampling unit. Details of the sampling procedure are available elsewhere and will not, therefore, be repeated here (see e.g., Population Problems Research Council, 1988).

In the 1986 round, each respondent was asked about her occupation at the time of the survey. The pattern of responses to this question was as follows: 41.9 percent for housewives, 17.7 percent for family workers, 16.7 percent for full-time paid employees, 17.0 percent for part-time paid employees, 2.3 percent for business proprietors, 0.9 percent for self-employed workers, 3.0 percent for others, and 0.4 percent for no answer.

### III. Female Labor Force Participation, Living Arrangements, and Family Life Cycle

#### 1. Labor force participation

Let us discuss the age profile of labor force participation among married women whose current residences are patrilocal or neolocal. The relevant data are displayed in Figure 1. When examining the age profiles in Figure 1 and subsequent displays, it is very important to remember that the data refer to currently married women. For this reason, the bimodality in the age profile of labor force participation observed among all women does not reappear among married women.

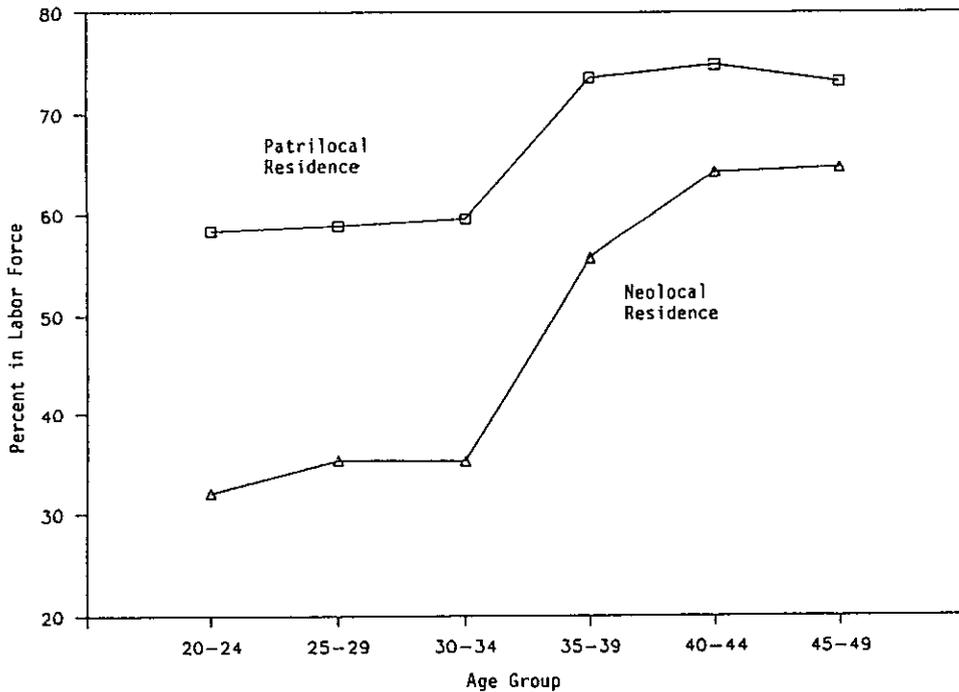


Fig. 1. Labor force participation rates by patrilocality of current residence, for married Japanese women of childbearing age, 1986.

As can be seen from Figure 1, the age profiles of labor force participation among women who maintain patrilocal and neolocal residences exhibit nearly identical patterns. Both curves are basically flat between ages 20-24 and 30-34 and both rise dramatically between ages 30-34 and 40-44 before moving towards one another among married women at the end of their reproductive cycles. The curves are, however, clearly separated from one another at all ages, with women in patrilocal residences being more likely to participate in the labor force than those with neolocal households. In all but the oldest age group, the difference between the two curves amounts at least to 10 percentage points and often more.

Age profiles of labor force participation for women at different stages in the family life cycle are exhibited in Figure 2, where women are simultaneously categorized according to whether or not they have children aged under 7 and 7 or more; age 7 is the division between preschool and school-aged children in the present data set.

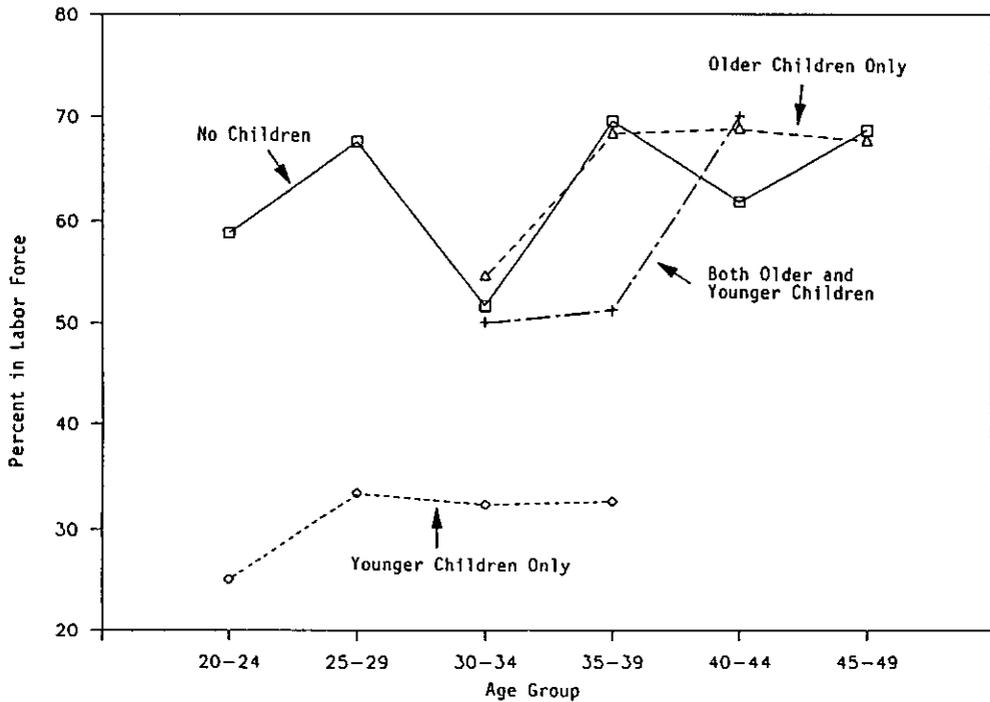


Fig. 2. Labor force participation rates by presence of children aged 6 or less and children aged 7 or more, for married Japanese women of childbearing age, 1986.

The most striking feature of Figure 2 is the depressed level of labor force participation among those with young children. The distribution rises between ages 20-24 and 25-29 and is basically flat thereafter. It never gets as high as 35 percent. In contrast, the age profiles of labor force participation among the other groups of women never fall as low as 45 percent. For the age groups in which they overlap, the age profiles for women with no children and those with only older children are virtually identical. This is consistent with the view that it is only younger children that inhibit a woman's labor force participation. Furthermore, the distributions for both these groups are rather flat, save for the low point of labor force participation observed at ages 30-34.

The low point of labor force participation at ages 30-34 among women with only children aged 7 or more is quite understandable. Even though their children are of school age, they are still typically in their preteens and require attention outside of school hours. By ages 35-39, the children of women who only have older children will be nearing or entering their teens and more nearly capable of taking care of their own needs. The drop in the labor force participation rate of women aged 30-34 with no children may represent premature withdrawal from the labor force in the anticipation of family formation.

The pattern of labor force participation observed for women with both older and younger children can be interpreted in much the same way as the age profile observed for women with older children only. At ages 30-34, their older children are still quite young, and by ages 35-39, their older children, while now capable of caring for themselves, are still not old enough to look after their younger siblings. This changes for women aged 40-44 with both younger and older children. For these women, there is apt to be appreciable spacing between their oldest and youngest children, so the oldest child can help out with child care.

The results displayed in Figure 2 are quite consistent with the view that the age profile of female labor force participation reflects primarily the impacts of life cycle stage rather than the impacts of age per se. We have also inspected the joint impacts of residential patterns and the presence of older and younger children on the labor force participation levels of women. These results are not shown because they add little to what can be gleaned from Figures 1 and 2.

## 2. Part-time paid employment

The structure of employment among married women can be usefully thought of as a large onion. The outer layer, which has just been examined, is comprised of housewives. At the core are full-time paid employees who are essential to the functioning of the industrial firms and government offices. In between are the layers of workers in the informal sector and part-time paid employees. In Japan, it can be reasonably argued that part-time paid employees comprise the most marginal layer of the female labor force (Ogawa, 1987). These workers do not receive bonuses, and move in and out of the labor force with the movement of the business cycle. By way of contrast, the self-employed often provide essential services, and family workers in small shops are an important part of the distribution system in contemporary Japan. Furthermore, self-employed and family workers work almost full-time. For instance, data gathered in one of the nationwide surveys on the Japanese family system conducted by the Mainichi Newspapers in 1988 show that, on the average, married women of childbearing age who were self-employed worked 45 hours per week and those who were family workers worked 37 hours per week, as opposed to 43 hours for full-time paid employees and 31 hours for part-time paid employees. Moreover, according to the Labour Force Survey regularly undertaken by the Statistics Bureau of the Government of Japan, 35 hours a week are used as the criterion for distinguishing between full-time and part-time workers. Based upon this criterion, self-employed and family workers may be categorized as full-time workers. For these reasons, the next layer of the female labor force which we examine is the group of part-time paid employees.

The age profiles of part-time paid employment observed among women with currently patrilocal and neolocal residences are compared in Figure 3, which is based only upon married women in the labor force. The two begin at approximately the same level and fall in a virtually parallel manner between ages 20-24 and 25-29. The downward drift in part-time employment between ages 20-24 and 25-29 is obviously related to family formation patterns. Women at ages 25-29 are the most likely to have small children.

As can be seen in Figure 3, the gap between the incidence of part-time work among women with patrilocal and neolocal residences widens appreciably subsequent to ages 25-29 and remains substantial

throughout the remainder of the reproductive years. As expected, women with neolocal residences, who are less likely to be in the labor force (see Figure 1), are more likely to be part-time workers if they join the labor force than are those with patrilocal residences who potentially have a child-care system built into their household structures. The only other feature of Figure 3 worthy of note is the fact that the incidence of part-time work falls off among labor force members at older ages. This occurs, for no obvious reason, somewhat more precipitously among those with patrilocal residences than among those with neolocal residences.

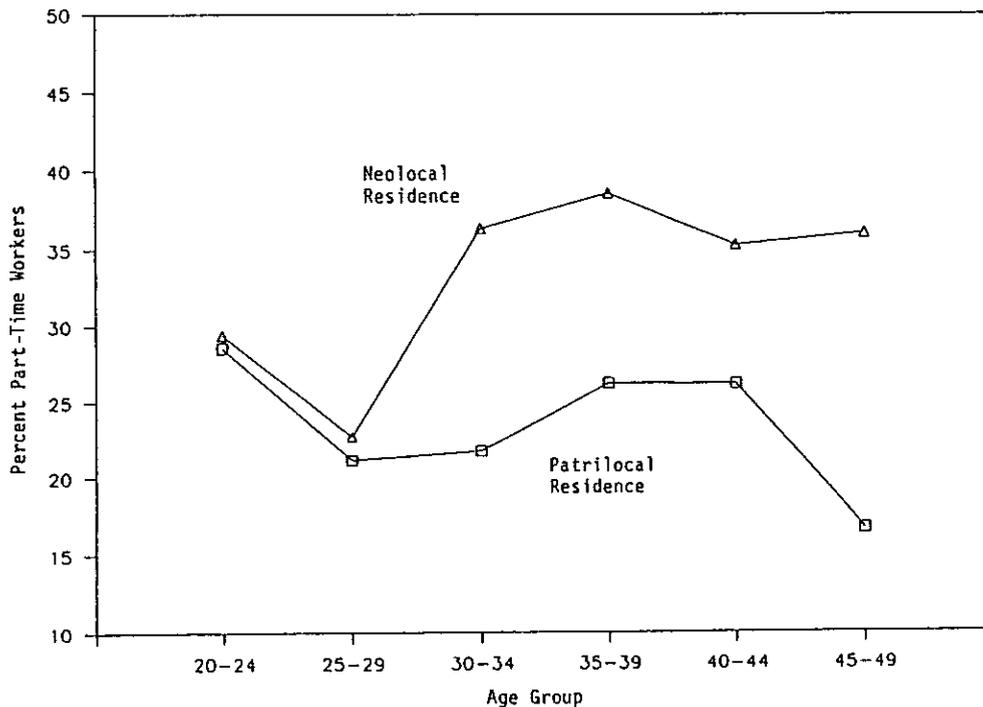


Fig. 3. Percent part-time workers by patrilocality of current residence, for married Japanese women of childbearing age in the labor force, 1986.

The age profiles of part-time paid employment for women with children of different ages are shown in Figure 4. The most striking feature of Figure 4 is the relatively low level of part-time work observed among women with young children. Evidently, if such women work, they work full-time in paid employment or in the more flexible informal sector. For women whose children are aged 6 or less, the school does not provide a surrogate for child-care arrangements. Thus, if these women work, they do not work at part-time paid employment which would typically yield only a marginal increment to household income once adjustments are made for the cost of child care.

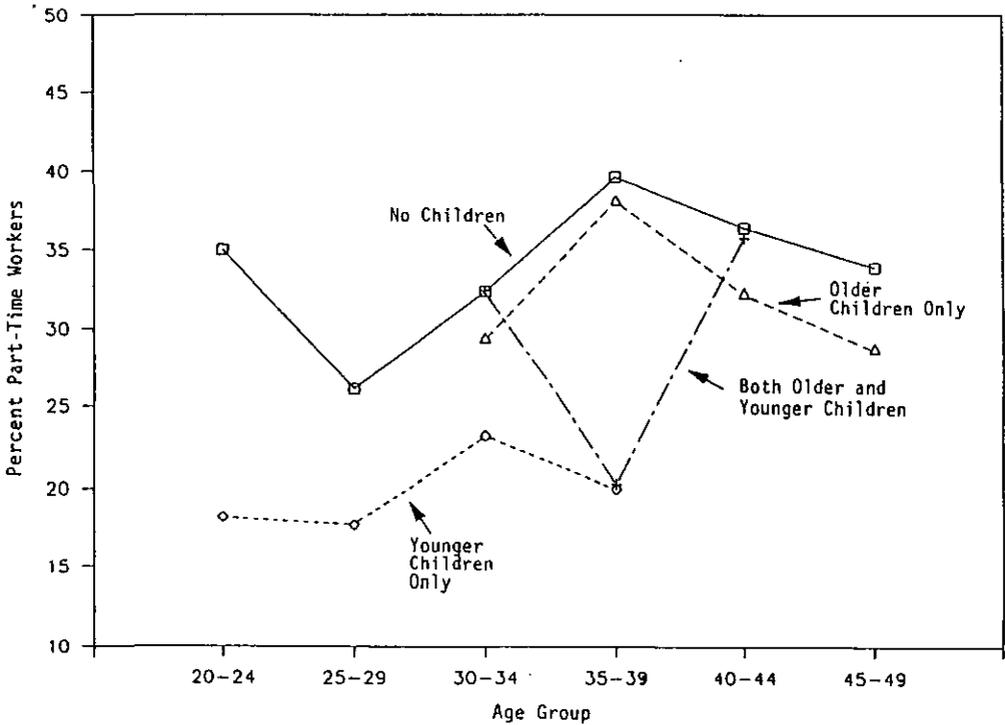


Fig. 4. Percent part-time workers by presence of children age 6 or less and children aged 7 or more, for married Japanese women of childbearing age in the labor force, 1986.

As was the case with labor force participation, the age profiles for part-time paid employment are very similar for women with no children and for those with only older children. The decline in the fraction of women aged 25-29 most likely reflects marriage patterns. A great many marry between ages 20-24 and ages 25-29, so that the figure for married women aged 25-29 includes a sizeable fraction of women who were not married at ages 20-24. Women with premarital work experience and with careers tend to marry later than those who marry at earlier ages. As they join the pool of married women and continue their careers before they have children, the relative number of part-time paid employees shrinks. Thus, the movement through marriage of women into the group of childless women and the movement out of the same group through family formation help explain the dip in the relative number of part-time paid employees among childless women at ages 25-29.

Similarly, the decrease in the relative numbers of women in part-time employment among women with both younger and older children at ages 35-39 may be explained in part by the movement of women out of the group with only young children into the group with both younger and older children. This occurs in two ways. First, women at ages 30-34 having more than one young child may have one of the children pass the cutoff threshold of age 7, and are accordingly moved from one distribution to the other because of their children's age. Second, a woman aged 30-34 may have only one young child, but due to the birth of a following child, at ages 35-39, she may still have a child under 7 when the older child passes the threshold. In either case, the woman will behave like a woman with a young child and eschew part-time paid employment if she works at all, owing to the costs of child-care. By ages 40-44, some of the women with both older and younger children may return to part-time work because their older children are now old enough to assume some child-care responsibilities. This expands both the labor force participation rate (see Figure 2) and the relative number of part-time paid employees of those in the labor force among 40-44-year-old women with both younger and older children.

The joint impact of residential pattern and the presence or absence of children of different ages was also examined. These results are not displayed because they only confirm what can be inferred from Figures 3 and 4. With very few exceptions, the examination of

the joint impacts of residential pattern and family life cycle stage -- as revealed by the presence or absence of preschool and school-aged children -- are consistent with the following generalizations: (i) older women are less likely to be engaged in part-time paid employment, (ii) women with currently neolocal residences are more likely to be engaged in part-time paid employment, (iii) women with no small children are also more likely to be engaged in part-time paid employment, and (iv) there is no consistent impact of the presence or absence of older children on part-time work. All of these conclusions are conditional upon a woman's participation in the labor force and pertain after controls are made for the other variables.

### 3. Core employment

As the final step in our preliminary analysis of the patterns of female employment, let us examine the age profiles of the choice between full-time paid employment and work in the informal sector. As in the previously reported analyses for labor force participation among all married women and of part-time paid employment in the female labor force, these profiles were examined separately for women with currently patrilocal and neolocal residences, as well as for those with and without children under and over 7 years of age. The profiles are not exhibited here, since they show no systematic pattern of differentiation either between those with patrilocal and neolocal residences or between those with and without children of different ages. What the profiles do show, however, is a near monotonic decline with respect to age in the percentage of women in full-time paid employment. This result pertains, of course, only to those women in the labor force who are not part-time paid employees. Nonetheless, it reveals that the growth in the relative number of paid employees among all women has been achieved in large measure through the process of cohort succession.

When the impacts of residential pattern and life cycle stage on full-time paid employment are jointly examined, some patterns emerge which are obscured when they are separately studied with only a control for woman's age. The relevant data are displayed in Table 1. Owing to the number of cases, only a dichotomous control for age can be introduced. As can be seen from the odds reported in the bottom panel of the table, the impact of age is both clear and pronounced.

Table 1. Salaried employee status by ages and presence of children, age and patrilocality of current residence, for married Japanese women of childbearing age, for full-time paid employees and workers in the informal sector

Ages and presence of children	Respondent's age								
	under 35			35 or over					
	Patrilocality of current residence								
	Yes		No		No				
	Salaried employee	Other	Salaried employee	Other	Salaried employee	Other			
Children <u>7</u> or over	14	16	7	17	8	22	10	26	
Children under <u>7</u>	8	7	6	6	77	141	133	211	
No children under <u>7</u>	32	25	36	24	0	6	3	9	
No children under <u>7</u>	15	8	31	14	10	31	34	35	
	Frequencies								
	Odds salaried employee								
Children <u>7</u> or over	0.875		0.412		0.364		0.385		
Children under <u>7</u>	1.143		1.000		0.546		0.630		
No children under <u>7</u>	1.280		1.500		---		0.333		
No children under <u>7</u>	1.875		2.214		0.323		0.686		

The controlled comparisons also reveal a consistent impact of the presence or absence of young children. Women with no younger children are more likely to be full-time paid employees, regardless of the age, residential pattern; and the presence or absence of older children. What is true for the presence or absence of younger children also characterizes the impact of older children, but only among younger cohorts of married women.

#### IV. Logit Models for Female Labor Force Participation and Type of Employment

The basic results presented to this point leave little doubt that there are clear and meaningful associations of both residential pattern and life cycle stage with both female labor force participation and type of employment. Obviously, there are other variables which exert an influence over female labor participation. Any conclusion about the significant of residential pattern and life cycle stage on the role of women in the labor force awaits their assessment in a multivariate context.

The data set available for the present study enables us to control for a number of known and/or potential correlates of the female labor supply. These include wife's years of schooling, husband's income (in ten thousands of yen), and age of women, all of which we treat as interval variables. Husband's occupation and wife's premarital work experience are also available, but they must be treated as a series of dummy variables. Three dummy variables are introduced for husband's occupation according to whether or not he was (i) a salaried professional or administrative worker, (ii) a paid clerical worker or sales clerk, (iii) a paid craftsman, factory or other blue-collar worker. The implicitly missing category, which serves as a reference group for the others, consists primarily of self-employed professionals and shopkeepers, as well as a handful of farmers and other workers. The premarital work experience of women is also represented by three dummy variables which indicate whether those who worked were (i) full-time paid employees, (ii) part-time paid employees, or (iii) worked at another type of labor in the informal sector. The omitted category is comprised of women who did not work before marriage. A

final control factor is another dummy variable which reflects whether or not the respondent currently lives in an urban area.

The indicator of residential pattern is yet another dummy variable which takes on the value 1 if a woman's current residence is patrilocal. The indicators of life cycle stage are, however, operationalized in a somewhat different way to take advantage of the multivariate framework. Four variables are introduced: (i) number of children aged less than 1, (ii) number of children aged 1 or more, but less than 7, (iii) number of children aged 7 or more, but less than 19, and (iv) number of children aged 19 or more.

It is important to note, however, that both variables on residential pattern and life cycle stage are likely to be endogenous. As regards the causal relationship between patrilocality and female labor force participation, the nationwide survey on the Japanese family system conducted jointly by the Mainichi Newspapers and Nihon University in 1988, which has been cited earlier in connection with the average hours worked for each occupational category, provides useful information pertaining to the reasons for coresidence. In this survey, 32 percent of currently married women of childbearing age were maintaining patrilocal residences. Approximately 53 percent of those with patrilocal households stated that because their husbands were the eldest, they were coresiding with their parents-in-law. About 15 percent of them were in patrilocal residences due to their parents' wishes. More than 10 percent of them stated that they wanted to stay close to their parents-in-law. Only 4 percent moved into patrilocal residences with the expectation that their parents could take care of their children and household chores. These results seem to suggest that the main motives for coresidence are highly cultural in contemporary Japanese society, and that it is unlikely that they start to share residences with their parents in order to pursue or continue their professional career. Furthermore, because there are pronounced differences, as observed in our earlier tabular analysis, in the propensity to participate in the labor force between women in patrilocal residences and those in neolocal residences, these survey results perhaps should be interpreted to imply that patrilocal residences facilitate labor force participation among married Japanese women. Thus, the causal relationship appears to be predominantly one-way from patrilocality to women's labor force participation.

Insofar as the variables on life cycle stage are concerned, the presence of young children is likely to be affected by women's labor force participation (Cogan, 1980; Heckman, 1980; Hanock, 1980; Bauer and Shin, 1987). Overlooking the endogeneity of these variables would tend to bias the impact of life cycle stage upon labor force participation among married Japanese women. Unfortunately, due to the fact that the available data did not provide a sufficient number of good instruments to carry out estimation, no practical solution to this potential estimation problem is available in the present study.

Since the control variables are commonly utilized in economic, sociological and demographic investigations of female labor force participation, we eschew a lengthy discussion of their postulated impacts upon the dependent variables of interest, viz., labor force participation (among all married women of childbearing age), part-time paid employment (among those in the labor force), and full-time paid employment (among those in the labor force who are not part-time paid employees). In the multivariate results reported below, we also extend the tabular analysis by examining family workers as a component of those in the labor force who are not part-time paid employees. This leaves business owners and the self-employed as the implicitly missing category from the full analysis of female labor force participation and type of employment. Although no further discussion of the impacts of the variables included in the analysis is offered at this juncture, a tabular summary of their postulated effects is provided in Table 2, where "+," "0," and "-" indicate positive, insignificant, and negative effects. Some variables which are not expected to enter all the equations for the separate dependent variables have been retained to keep the set of control factors identical from one analysis to the next. This enables one to identify how each of the predictor variables is related to the type of employment of married women. Three exceptions to this general strategy involve the square of husband's income, the square of wife's age, and the interaction of age and patrilocality of residence, which are entered only in the equations where tabular materials and graphs indicated that they were operative. Another exception is wife's premarital work experience, where all three dummy variables representing this classification are included only in the analysis of labor force participation. In other analyses,

the dummy variable for part-time paid employees was dropped due to the small number of cases in this category.

Table 2. Summary of postulated impacts of predictor variables on labor force participation and type of employment among married Japanese women of childbearing age

Independent variables	Dependent variable			
	Labor force participation	Part-time paid employment	Full-time paid employment	Family workers
	Postulated impacts			
Patrilocality of current residence	+	...	0	+
Children less than 1	-	-	-	+
Children aged 1-6	-	-	-	+
Children aged 7-18	0	+	-	+
Children aged 19 or more	0	+	+	0
Wife's age	+	0	-	+
Age squared	...	...	+	...
(Age)·(Patrilocality of residence)	...	-	...	...
Husband's income	-	+	0	0
Square of husband's income	...	-	0	0
Wife's years of schooling	+	-	+	-
Urban residence	-	+	+	-
<u>Husband's occupation</u>				
Professional or administrative	-	+	+	-
Clerical and sales	-	+	+	-
Blue-collar	-	+	+	-
<u>Wife's premarital work experience</u>				
Full-time paid employee	+	-	+	-
Part-time paid employee	+	...	...	...
Other job	+	-	-	-

Before turning to the analyses, a comment should be made about a significantly missing variable, namely, female earnings. A standard way of dealing with this problem is to calculate expected market wages for women on the basis of a wage equation estimated from the data set and adjusted for selectivity bias (Heckman, 1980). Another approach is to use exogenous data on wages, often from government surveys, and simply assign women an expected market wage on the basis of the average wages of women who have demographic and socioeconomic profiles identical to their own. For example, Shimada and Higuchi (1985) assigned women expected wages on the basis of their age, education, and prefecture of residence. In the present study, neither of these strategies is adopted because (i) no requisite wage data for employed women have been available in the data set at hand to adopt the first strategy and (ii) the characteristics on which one might assign women expected wages by using external sources have already been incorporated in the analysis as control variables such as age, education, urban residence, and premarital work experience.

The logit model is appropriate in the present case, owing to the qualitative nature of the dependent variables. Logistic regressions including the measures of residential pattern and life cycle stage, as well as the control variables are exhibited in Table 3. Comparison of Tables 2 and 3 reveals that all of the significant coefficients have the expected sign. Thus, there is good agreement between expectations and the empirical results. However, a number of factors thought to enter the equations turn out to have insignificant coefficients.

Although it yields a relatively low coefficient of determination, the labor supply equation is in one sense the most satisfactory, since all but one of the variables thought to enter the equation have significant coefficients. Women who held part-time jobs prior to marriage are no more likely to be currently working than are women who did not work before marriage. All of the remaining variables behave in the expected manner. The results indicate, even after introducing all the control factors, that patrilocality of residence has a substantial positive impact on the female labor supply, while the presence of an infant and other preschool-age children retards female labor force participation. Women with older children, however, do not behave in a significantly different way, compared with those with no children. Two of the remaining effects require comments. The coeffi-

coefficients of the dummy variables representing husband's occupation are all negative and fairly homogeneous in magnitude. The reason for this is quite simple; the implicitly excluded category contains shopkeepers, as well as a handful of farmers, whose wives have ready-made employment opportunities as family workers in the family store or on the family farm. The coefficient of urban residence is negative, which occurs because of the relative prevalence in rural areas for employment in the informal sector. In this regard, it should be remembered that, even though it is declining, a relatively large number of Japanese women continue to work outside of the organized sector.

In the analysis of part-time paid employment, neither wife's age nor patrilocality enter the equation as linear terms. Instead, they enter jointly in the form of an interaction which indicates that part-time paid employment declines with age among those living with their husband's parents. Wife's education is also in the equation. Better educated women are less likely to work part-time, if they work at all. This occurs not only because their opportunity costs are higher, but also because the jobs which enable them to utilize their acquired skills and move up the occupational and income ladders are more likely to be full-time posts. Part-time positions are concentrated in factories, offices, and service establishments. These are concentrated in urban areas, so, as expected, urban residence exhibits a substantial positive association with part-time employment among female labor force members.

The pursuit of part-time paid employment among women falls off curvilinearly with husband's income. This reflects that the income from a woman's part-time work supplements husband's income to earn enough household income required for daily living. If her income has little or no impact upon household income owing to the rising tax rates in higher household income brackets, her incentive to work is severely reduced.

The dummy variables for husband's occupational category are always positive and quite homogeneous in magnitude. This occurs with respect to part-time paid employment among women in the labor force for the same reason that the coefficients of the variables representing husband's occupation were negative and relatively homogeneous in the labor supply equation. Because the implicit comparison group

includes shopkeepers, women whose husbands are paid employees have no ready-made opportunities in family businesses. Consequently, they are more likely to wind up as part-time employees, if they are in the labor force.

The only one of the indicators of life cycle stage which enters the equation for part-time employment is that for children aged 7-18, which has a modest positive impact. Women with school-aged children cannot work full-time and fulfill their role as homemakers. They can, however, work part-time while the children are at school and still be at home when the children return from school without having to make any child-care arrangements. It is not surprising, therefore, that part-time paid employment is attractive to women with school-aged children, given that they are in the labor force.

The equation for full-time paid employment among labor force participants who are not working at part-time jobs is particularly simple since only a few of the predictors enter the equation. The dummy variables for husband's occupation enter the equation with homogeneous, positive signs for the very same reason as they have entered the equation for part-time employment with positive and homogeneous signs. Wife's age enters the equation curvilinearly, which reflects the recent and rapid growth of full-time paid employment among women. The curve is concave upwards, but the part of it which passes through the data is the left-hand side where the curve is falling. The only other factor which enters the equation for current full-time paid employment is work prior to marriage at a similar post, which has the expected positive impact.

Although family work is nearly the flip side of full-time paid employment once part-time workers are removed from the analysis, the equation for family work is rather more complicated than the one for full-time paid employment. The variables in the equation for family work, excluding the square of age, enter the equation for family workers with opposite signs, as expected. However, a number of other factors are associated with employment as a family worker. Women with infants, who are in the labor force but not as part-time workers, are more likely to be family workers, presumably because family work can often be performed while they are simultaneously caring for their infants. In addition, women living in urban areas and with more schooling are less likely to be family workers, again as expected

Table 3. Logistic regression analyses of female labor force participation and type of employment, for married Japanese women of childbearing age, 1986

Independent variables	Dependent variable			
	Labor force participation	Part-time paid employment	Full-time paid employment	Family workers
Coefficients				
Intercept	-.3709	-1.1147	3.4757	2.3419+
Patrilocality of current residence	.6588**	...	-.2464	.4637**
Children less than 1	-.7325**	-.1291	-.3711	.6868+
Children aged 1-6	-.4720**	-.0573	-.1940	.2611
Children aged 7-18	.0607	.1456+	-.0874	.0584
Children aged 19 or more	.1576	-.1163	.2726	-.1473
Wife's age	.0492**	-.0093	-.2941+	.0304+
Age squared	...	...	.0036+	...
(Age)·(Patrilocality of residence)	...	-.0121**	...	...
Husband's income	-.0016*	.0045**	-.0013	.000099
Square of husband's income	...	-.000035**	.00000013	-.00000022
Wife's years of schooling	.0505+	-.2174**	.0432	-.1321**
Urban residence	-.4513**	.8546**	-.1621	-.4390*
<u>Husband's occupation</u>				
Professional or administrative	-1.5786**	1.9092**	2.7601**	-3.1796**
Clerical and sales	-1.2031**	2.1747**	2.7678**	-2.9720**
Blue-collar	-1.0820**	2.2130**	2.5580**	-3.0096**
<u>Wife's premarital work experience</u>				
Full-time paid employee	.3506+	-.3374	.7621*	-.6481*
Part-time paid employee	-.1062	...	...	...
Other job	.3858+	-.0479	-.5330	-.6035+
Other statistics				
R <sup>2</sup> adjusted	.2011	.2008	.3513	.4227
Likelihood ratio test	399.6	221.9	296.0	362.3
Number of cases	1883	926	770	770

- \*\* Significant at .01 level with one-tail test.
- \* Significant at .05 level with one-tail test.
- + Significant at .10 level with one-tail test./pa

since urban residence is a proxy for opportunities and family work typically does not take full advantage of skills acquired through education. Finally, patrilocality has a large and positive impact upon family work, primarily because such residential arrangements may be conducive to a woman working on the farms and in the businesses of her in-laws.

In sum, the results of the multivariate analyses reveal that the labor market behavior of married Japanese women is governed in much the same way by the factors implicated in the labor force behavior of women in other developed societies. This occurs despite the relatively sizeable number of Japanese women who work in the informal sector. The behavior of Japanese women is, however, affected by residential patterns, a feature which cannot be observed in other industrialized societies where neolocality of residence after marriage is the overwhelming choice. The results also indicate, with a single modest exception, that the labor market behavior of women with children of school age and above does not differ significantly from that of women with no children. Finally, consistent with the conclusions of Hill (1983 and 1989), there is strong evidence that the decisions to enter alternative types of employment are not identical ones. On the contrary, they are governed by different sets of factors. Modelling type of employment involves factors different from participation per se.

## V. Fertility Aspirations

Decisions about career and family are intimately intertwined and they jointly determine the way in which a woman's life cycle unfolds. Career decisions open and close possibilities for family formation and vice versa. In the present section, an attempt is made to provide some insight into the effect of labor force participation upon fertility. In the previous section, however, child variables have been included in the labor force equations, and the resulting estimated equations may suffer from simultaneity bias. To avoid this simultaneity problem involved in the analysis of female labor force participation and fertility, we have chosen as the dependent variable the number of additional children desired, which can be plausibly regarded as dependent upon current labor force status.

We begin by examining the bivariate relationship between labor force status and number of additional children wanted. Then, we successively add to the equation for number of additional children a variety of control factors. First, we include demographic and socioeconomic controls. These are identical to the control variables included in the labor force equations, save that wife's age is replaced with duration of current marriage, which more nearly measures the length of time she has had to achieve her family size goals. We also change one of the dummy variables for husband's occupation so that the comparison group becomes farmers and blue-collar workers. We then add the child variables to the equation to capture past fertility.

The regression analyses of number of additional children wanted are reported in Table 4, where the labor force status of women has been represented by four dummy variables which identify her type of employment. Because the implicit comparison category is women who are not currently in the labor force, tests of the significance of the dummy variables for labor force status pertain to contrasts between women in different types of employment with those who do not work. As presented by Model A in Table 4, the gross relationship between labor force status and number of additional children wanted reveals that, compared to nonworking women, those in full-time paid employment are more likely to desire additional children, while those in part-time paid employment and those who are self-employed are less likely to desire additional children. These gross relationships, however, reflect in part the operation of demographic and socioeconomic factors upon future fertility aspirations. Women in full-time paid employment, for example, are younger and have had less time to realize their family size goals.

When we introduce only the demographic and socioeconomic control factors, the gross relationship between current labor force status and number of additional children wanted practically vanishes, as shown by Model B in Table 4. Only the coefficient for family workers is significant, and it is significant at a level unacceptable to some researchers. Although introducing the control factors raises the coefficient of determination from 2 to 18 percent, only two of the control factors exhibit a significant relationship to number of additional children wanted. The equation is dominated by marital duration, as

Table 4. OLS regression analyses of number of additional children wanted, for married Japanese women of childbearing age, 1986

Independent variables	Number of additional children wanted		
	Model A	Model B	Model C
	Coefficients in raw score form		
Intercept	.2323**	.6242**	1.0494**
Full-time paid employees	.1052**	.0110	.0377
Part-time paid employees	-.0885**	-.0373	-.0147
Self-employed	-.1262+	-.0417	-.0097
Family workers	-.0272	.0570+	.0936**
Husband's income	...	-.00011+	-.000094+
<u>Husband's occupation</u>			
Professional or administrative	...	.0385	.0325
Clerical or sales	...	.0446	.0388
Shopkeepers and self-employed	...	.0090	.0135
Wife's years of schooling	...	.0093	.0143*
Urban residence	...	.0046	-.0212
Patrilocality of current residence	...	.0169	.0291
Marital duration	...	-.3273**	-.4486**
Children less than 1	...	...	-.1632**
Children aged 1-6	...	...	-.2576**
Children aged 7-18	...	...	-.1717**
Children aged 19 or more	...	...	.0478+
	Other statistics		
R <sup>2</sup> adjusted	.0171	.1828	.2770
Number of cases	1883	1883	1883

\*\* Significant at .01 level with one-tail test.

\* Significant at .05 level with one-tail test.

+ Significant at .10 level with one-tail test.

one would expect, since those who have been married the longest have had sufficient time to complete their final family size goals. There is also a modest negative impact of husband's income on number of additional children wanted.

Adding the child variables, which collectively take into account number of children ever born, increases the coefficient of determination by almost another 10 percent and produces some modest changes in the coefficients of the remaining variables, as indicated by Model C in Table 4. The child variables themselves have the expected negative coefficients, except for the number of children aged 19 or above which has a modest positive coefficient. Adding the child variables to the equation also enhances the impact of marital duration. The coefficient for family work continues to be positive, but its magnitude is increased substantially to a level which is significant by a conventional criterion. Wife's schooling now enters the equation with a positive sign. This occurs even though marital duration has been controlled. However, we know from the labor force equations that better educated women are more likely to be in the labor force. If labor force time is subtracted from length of marriage, then better educated women have had less time to raise their families and, for this reason, want more additional children.

In Model C, with all the control variables in the equation, the impact of family work continues to remain both positive and significant. If this pattern holds and opportunities in the informal sector continue to dwindle, then Japanese fertility may move still further downwards. Also, since children can perform some tasks on family farms and in family businesses, the positive coefficient for family work is consistent with the view that the changing economic value of children is a contributing factor to fertility declines.

## VI. Concluding Remarks

In this paper, we have reviewed trends in the labor force participation and type of employment pursued by Japanese women. For a sample of married Japanese women of childbearing age, we have examined the determinants of labor force participation and type of employment among those in the labor force. Our analysis has focused upon the

impacts of residential pattern and life cycle stage. After controlling for a host of known determinants of female labor force status, patrilocality of current residence has been observed to have a positive impact on labor force participation and an adverse impact on pursuit of part-time paid employment which becomes more pronounced as women age. These results may well foretell a rising wage bill for Japan. The reason for this is rooted in demographic trends. The population of Japan is aging rapidly and the old-age dependency ratio is inexorably set on an upward spiral (Ogawa, 1989). However, there is also a long-term decline underway with respect to patrilocality of residence. If these trends continue, an important source of female labor supply will dry up as the built-in child-care systems of three-generation households disappear. This will occur simultaneously with an increased demand for the labor of those of working age. Women's wages have been rising and they seem likely to continue their upward spiral in order to attract more women into the labor force.

The analysis of life cycle stage has revealed that the main impact of children is upon labor force participation, since the child variables have only modest impacts upon type of employment. The results also show that the labor market behaviour of women with children beyond preschool age is very similar to that of women with no children. The analysis also reveals that the type of employment pursued by women in the labor force is governed by somewhat different decision-making processes. The factors which govern entrance into alternative types of employment vary from one type of work to another. The control factors entered into the labor force equations behave largely in the manner expected and in parallel with findings observed in other developed countries.

In the final section of the paper, we have been able to demonstrate that the labor force position of women is related to their future fertility aspirations. This holds even after controlling for a plethora of standard demographic and socioeconomic factors. The results reveal that women in family work are likely to desire somewhat more additional children than those out of the labor force.

## Acknowledgements

The author is grateful to the Population Problems Research Council of the Mainichi Newspapers for permitting him to utilize the 18th Survey on Fertility and Family Planning.

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