

WAGE DIFFERENTIALS AND LABOUR SUPPLY OF MARRIED WOMEN IN JAPAN: PART-TIME AND INFORMAL SECTOR WORK OPPORTUNITIES*

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This paper studies the pattern of labour supply of Japanese married women. The study develops and tests a discrete work choice model with a differing level of fixed cost of work and equalizing wage differentials. This accounts for differences in work characteristics of the regular status and part-time status work at firms, the family and self-employment. A 20 to 30 per cent hourly wage differential was observed between work categories with control on skills, region and other variables. Different effects are studied of the number and ages of children, a grandmother's presence and the wife's educational attainments on the category of work selected.

The data employed come from *The Occupational History and Mobility Survey of Women 1983* (OHMS), conducted by the National Institute for Vocational and Occupational Research, and allow detailed wage regression and consideration of different work categories which were not feasible in previous works. Empirical regularities of the Japanese labour market, such as the absence of growth in labour participation for mothers with small children, are better explained when work categories are dealt with separately.

1. Introduction

In the last twenty years a significant change has been observed in the structure of Japanese female labour participation, namely, a drastic decline in employment in the informal sector and a rapid increase in part-time work in firms. This phenomenon is important in analysing empirical regularities of the labour market which are unique to Japan. It also offers an opportunity for the empirical examination of qualitative aspects of work with regard to home-working and time spent at home.

Labour supply models often take the form of a choice of number of hours worked based on a given hourly wage rate. Such a model is extensively tested in western literatures (see, for example, Heckman (1979), Schultz (1980), Killingworth and Heckman (1986)). However, effective non-market time depends also on the work choice. Child care, for example, is more easily accommodated by working wives, when the work arrangement is less formal. The wage level offered by the market may also depend on work choice. Instead of treating time as the single variable that determines the level of output in non-market activities, this study assumes that a wife makes a discrete choice of work categories to select an appropriate balance of time at home and monetary income.

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The paper shows empirically, first, whether the wage of equally skilled workers varies between the four work categories. Subsequently, it tests a discrete work choice model with differing level of fixed cost and equalizing wage differential. The availability of detailed micro data has made it possible to divide workers into categories and obtain detailed personal and family background. Such a detailed specification is essential in examining wage differentials and the role of the family in the category of work selected.

Some studies in the past have considered related issues. A standard work-hour choice model under given market wage rate is estimated in Shimada et al. (1981), Higuchi and Hayami (1984) and Shimada and Higuchi (1985) using Japanese cross sectional data. Despite the model's large explanatory power in the west, its application to Japanese women is rather poor; some results were puzzling such as the unstable, instead of negative income effect of husband's income on the wife's work hours, and the positive, or unstable at best, rather than negative effect of young children on work hours.¹⁾ Yamada, Yamada and Chaloupka (1983), and Takayama and Arita (1992) focus on the large wage gap between the part-time workers and those regarded as being on the regular staff at firms and treat part-time employment separately from regular employment. However, all the above mentioned studies treat household-based employment as non-labour participation. Hill (1983, 1988) points out the importance of treating household-based employment separately from firm-based employment, or from cases of non-participation, in a country where large informal work opportunities exist. Hill, however, gives no consideration to the specific features of growing "part-time" employment opportunities in Japan. The low wage level compared to regular employment is discussed in the following section.

The structure of this paper is as follows. Section 2 provides the basic facts, the data, and the empirical test on wage differentials between four work categories. Section 3 outlines the model of discrete work choices with compensating wage differentials and econometric specifications. Section 4 presents the empirical results of work choice and the implication of the analysis. Some concluding remarks are given in Section 5.

2. Basic facts, data and wage differentials

2.1 The essential background

Table 1 shows the change in the composition of work categories over the two decades; a remarkable increase in part-time employment and a drop in participation in the informal sector, while the share of regular employment at firms is relatively stable. Yet work opportunities in the informal sector, namely self-employment, work in family businesses, and piece-rate work at home, still account for a quarter of the female work force in Japan, which is a considerably higher proportion than in western countries.²⁾

1) Their inference was that the logit model fits better than the work-hour choice model in the Japanese case.

2) For example, according to the International Labour Organization's *Yearbook of Labour Statistics*, the self-employed and family workers together comprised in 1987 only 6 per cent of the female work force in the US and 7 per cent in the UK.

TABLE 1
CHANGES IN THE COMPOSITION OF CATEGORIES OF WORK
PARTICIPATION FOR JAPANESE WOMEN

	Self- employed	Family Workers	Regular Employees	Part-time Employees
1971	15.6%	29.2%	48.4%	6.9%
1982	13.8%	22.2%	45.9%	18.1%
1992	10.2%	15.5%	47.4%	26.8%

Source: Statistics Bureau, Management and Coordination Agency, *Employment Structure Survey*

The growing opportunities for "part-time" work in firms also contrast with other countries. Often, part-time work is empirically examined in western works as the choice of shorter work hours with a given hourly wage rate. Representative government statistics, the Ministry of Labour's *Basic Survey on Wage Structure*, however, show that mean hourly wage rates decline by as much as 35 per cent for part-time employees compared with the regular employees.³⁾ Empirical examination has yet to show whether the wage gap derives from worker composition, such as low levels of skill, or whether the wage rate significantly declines when one chooses part-time work. The classification of part-time in Japan is not through hours worked alone. A substantial percentage of workers are classed as "part-time" by firms despite their long work hours. Fifteen per cent of female "part-timers" work the same hours as the regular employees at the same firm on the usual working hours basis, though "part-timers" have more freedom to take unpaid holidays (Ministry of Labour, 1992). "Part-time" work implies higher work-hour flexibility over a period of time but not necessarily shorter working hours on the usual work hours basis.⁴⁾

2.2 The data

The survey, *The Occupational History and Mobility Survey of Women 1983* (Koyo Sokushin Jigyodan Koyo Shokugyo Sogo Kenkyujo (1988)), conducted by the National Institute for Vocational and Occupational Research represents a national sample of 2490 females aged between 25 and 69 in 1983. Since years of average education decline and the share of informal sector workers significantly increases for women over the age of

3) The Ministry of Labour's *Basic Survey on Wage Structure* (BSWS) shows that the hourly wage gap between an average female part-time and a regular employee was as much as 36 per cent when bonus was included, and about 28 per cent when bonus was excluded in 1993. Because of lack of data on education and other personal variables, a detailed regression to take account of worker's skill was not possible in the BSWS.

4) The term "part-time" will be used for workers who are called "part-time" at firms regardless of usual working hours, since workers classified as "part-time" seem to enjoy more flexibility in work hours over a period of time. This classification also proved more significant in the empirical test of wage difference in the subsequent section. Non part-time workers at firms are "regular employees" (seishain). The paper also employs the terminology, "informal sector workers" or "household-based employment" as opposed to employment at firms. The informal sector workers comprise family workers both paid and unpaid (kazokujugyosha), self-employed workers (jieigyosha), and home-based piece-rate workers (naishokusha).

45, this paper limits its analysis to females between the ages of 25 and 44. Limiting the analysis to married women, and omitting any missing data reduces the sample to 941 observations. Although this represents a fairly small sample, it should be mentioned that this kind of micro data, covering workers in firms, in informal sectors and non-workers and giving detailed personal variables, is not generally available in Japan unlike the US.

Table 2 shows means and standard deviations for the data set. For the details of the survey, see Koyo Sokushin Jigyodan Koyo Shokugyo Sogo Kenkyujo (1988).

2.3 Accounting for the wage differential

Let us first look at whether the observed wage gaps between work categories disappear when skills of workers, region and other factors are controlled. Table 3 gives the result of wage regression on log hourly wage. Actual own income and usual weekly hours were used to calculate hourly wages.⁵⁾ The right hand column of Table 3 gives estimated coefficients on the three work status dummies of "part-time status employment at firms", "family workers or self-employed" and "home based piece-rate" while "regular status employment at firms" is used as a base along with coefficients on years of education, tenure and its square, and years of actual work experience. The left hand column adds controls of four occupation dummies, manual labour used as a base and the urban dummy.

The table shows that the gap narrows with added controls, yet a 29.5 per cent difference remains between the regular and part-time status groups, and a 34.9 per cent difference between the family worker, the self-employed and the regular groups.⁶⁾ Different specifications were tested. The wage gap shows a narrowing when the samples were limited to the more homogenous group.⁷⁾ Yet a 20 to 30 per cent wage gap remains between the part-time and regular employees as well as between the regular employees and the family workers or self-employed groups. The home-based

5) Hourly earnings variables were obtained from 21 annual income classes and normal weekly work hours. There are some limitations due to the data disposition. The data do not allow distinction between asset income and labour income. Since the unearned income of non-household heads of pre-retirement age is considered to be very small, I ignored the capital contribution. This could bias the estimated wage especially of the self-employed. However, the work-hours data and earnings data suggest that most of the self-employed in the sample operate on their own on a small scale, probably without much capital input. Another point to note is that wage could not be estimated for about half the family workers and that the wage regression was carried out omitting these samples. The definition of family workers in the survey is those who engage in the family business whether they are paid or unpaid. Thirty-seven per cent of family workers were unpaid. In addition, perhaps because of large variability in work hours, 10 per cent more reported no regular working hours, and for these hourly earning variables were also not obtainable. These limitations on data reduce the accuracy of estimated hourly earnings. However, it should again be mentioned that no other data to my knowledge allow even such a crude measure of wage estimation. One representative governmental statistics covering both informal and formal sector workers, Statistics Bureau, Management and Coordination Agency's *Employment Structure Survey* (ESS), for example, has only dispersed work-hour classes and income classes so that hourly earnings cannot be obtained within the sample. Observations with missing variables were included again in the logit analysis so long as relevant variables in the analysis were not missing.

6) Calculated by $\exp(\beta - 1/2 * V(\beta)) - 1$ following Kennedy (1981), β denoting the estimated coefficients in the Table 3 and $V(\beta)$ the estimated variance.

7) In order to capture the gap within the most homogeneous group, regressions also were carried out by limiting the sample to married employees of firms, with or without pre-school children. The wage gap between part-time and the regular narrows to about 25 per cent for those without pre-school children.

TABLE 2
THE MEAN ATTRIBUTES OF THE OHMW DATA

	(Women aged 25-44)			
	Non-labour participants	Employees of regular status	Employees of part-time status	Informal sector participants
Log hourly wage		6.53 (0.62)	5.96 (0.71)	6.04 (0.85)
Wife's annual earnings (10000 yen)	6.2 (30.2)	185.5 (108.3)	65.2 (38.1)	94.5 (89.5)
Husband's annual earnings (10000 yen)	412.0 (190.3)	341.9 (132.6)	354.4 (157.1)	388.0 (197.2)
Education (years)	11.9 (1.77)	12.0 (1.96)	11.2 (1.64)	11.4 (1.88)
Overall work (years)	5.5 (3.63)	12.7 (5.88)	10.3 (5.16)	14.3 (6.83)
Number of pre-school children	0.91 (0.86)	0.51 (0.71)	0.41 (0.67)	0.56 (0.82)
Number of children	1.91 (0.91)	1.83 (0.89)	1.95 (0.754)	2.04 (0.83)
1 = grandmother in household	0.22 (0.41)	0.52 (0.50)	0.28 (0.45)	0.29 (0.45)
1 = grandfather in household	0.15 (0.35)	0.33 (0.47)	0.16 (0.37)	0.21 (0.41)
Age	33.63 (5.00)	35.15 (5.78)	36.53 (4.95)	36.18 (4.85)
1 = husband self-employed	0.13 (0.34)	0.18 (0.38)	0.12 (0.33)	0.47 (0.50)
1 = urban-located	0.60 (0.49)	0.35 (0.48)	0.49 (0.50)	0.48 (0.50)
sample size	510	156	130	240

piece-rate workers earn the lowest wage of all, while the wage gap between the two groups of part-time status, family workers and the self-employed is statistically insignificant.

3. The compensating wage differential model and the work choice

3.1 The model

In the latter part of the paper, the effect of family composition, such as the age and number of children, cohabitation with grandparents, and husband's occupation, as well as the wife's skill, is considered in relation to the wife's discrete choice of work categories.

The model assumes differences in fixed costs of work and compensating wage differentials in the market-offered wages across work categories, resulting in higher home-production and higher consumption time for the low-wage sector. Examples of the work-dependent fixed costs are commuting time and child-care expenses. Piece-rate workers at home, for example, enjoy a flexible switch from market work to home production activities at their own discretion, though the hourly wage is low. One may choose the best timing to attend to cooking or care of the child, perhaps during short

TABLE 3
ESTIMATION OF THE WAGE FUNCTION

Dependent variables	Coefficient (t-value)	
intercept	5.084*** (17.954)	4.776*** (16.375)
education (years)	0.0431*** (2.165)	0.101*** (5.356)
tenure	0.0539*** (2.936)	0.0565*** (2.990)
tenure squared	-0.00135* (1.649)	-0.00137 (1.518)
years of work experience	0.0163*** (2.917)	0.0137*** (2.354)
1 = "administrative or skilled"	0.7628*** (6.253)	-
1 = "clerical or office"	0.4082*** (4.605)	-
1 = "sales"	0.5063*** (4.925)	-
1 = "service"	0.1311 (1.168)	-
1 = "urban located"	-0.0210 (0.332)	-
Work Status Dummies		
1 = "part-time status"	-0.2643*** (3.099)	-0.3597*** (4.089)
1 = "family worker and self-emp"	-0.3432*** (3.951)	-0.4057*** (4.620)
1 = "home-based piece-rate"	-0.4241*** (3.848)	-0.6936*** (6.566)
sample size		431
adjusted r square	0.3242	0.2822

*the coefficient estimate is statistically significant at the 10 per cent level.

**the coefficient estimate is statistically significant at the 5 per cent level.

breaks in market work, without incurring any commuting cost or baby-sitting expenses, and vice versa. Other informal sector work may also accommodate such freedom in the work arrangement, though the degree of flexibility may be less because of customers' demands. On the other hand, work in firms considerably limits the wife's initiative in home production activities as longer commuting hours are involved, work conditions are formally set by rules, and work output is monitored. Within employment at firms, a more flexible work-hour contract will reduce the monetary and psychological cost of market work.

The relative advantage of larger discretion versus higher monetary income depends also on the family composition such as the age of children, the presence of other adult members in the household and the husband's occupation. Small children often fall suddenly ill and it would cause much friction and unexpected expense,⁸⁾ if, for example, work hours are strictly designated. The problem may be lessened if an additional adult member is in the household.

The compensating wage-differential model can now be sketched as follows. The household maximizes the amount of commodity Z , which is a combination of goods X and consumption time L ,

$$Z = Z(X, L). \quad (1)$$

8) Neither day-care centres nor any other formal facilities provide care services for sick children of working mothers in Japan. The sudden sickness of a child in the morning, therefore, causes much psychological and monetary burden on working mothers. The stricter the work-hour designation, the wider the informal network one needs to build and maintain in order to have more candidates to resort to for such unexpected events.

The model is an extension of Granou (1977), and assumes that goods can be either produced at home X_h or purchased in the market X_m . They are perfect substitutes.⁹⁾

$$X = X_h + X_m. \quad (2)$$

An individual can choose to work N hours in one of the s work statuses at a fixed real wage W_s , and with a fixed real cost to work $C_s(E)$, the subscript s denoting the choice of work status, and E the factors affecting the cost, such as the age and number of children. Market goods can be purchased with labour and non-labour income I_0 :

$$X_m = W_s N + I_0 - C(E)_s. \quad (3)$$

An individual can also produce goods at home subject to diminishing marginal productivity:

$$X_h = G(H), \quad (4)$$

where H denotes work at home. Time endowment for the household is T . The fixed cost in terms of time is M_s , the subscript s denoting the choice of work status:

$$T = N + H + L + M_s. \quad (5)$$

For each work status s , the utility is maximized when,

$$Z_L/Z_X = W_s \quad (6)$$

$$G'(H) = W_s. \quad (7)$$

Comparing the maximized utility level of s statuses, the household selects the work status that gives the highest utility.

This paper will only consider work status choice of wives. Because of the lack of suitable data, husbands' income will be interpreted as fixed sources of income. Figure 1 depicts the model with two work categories, 1 and 2. The time and non-labour income endowment of the household is T and I_0 . The home production functions, the concave curves, shift downwards and inwards compared with that of non-market labour participation (shown by a dotted line) when the wife engages in market work, because of the fixed costs of work. The higher the cost, the larger the shift. The concave curve AQ_1E is the home production achieved under work 1. The market wage rate for work 1 is W_1 . At the optimum, the wife engages in home production activities for $A'h_1$ of the time, market work for h_1L_1 of the time, loses TA' of the time for switching, and spends the rest of the time in consumption (leisure). The utility level Z_0 is achieved. The market wage rate for work category 2 is W_2 , and the concave curve BQ_2F is the shifted home production curve that strictly compensates for the higher wage rate. The shift downwards represents the monetary fixed cost of work and the shift left the time cost of work. The achieved optima is P_2 . If the switching cost is more than that shown, the wife will choose work 1, and if less work 2.

The model also predicts that other things being equal, increase in non-labour

9) I assumed perfect substitutes only to facilitate the graphical exposition. The assumption is not crucial in constructing a compensating wage-differential model. One can easily construct a model where households maximize utilities derived from either market goods or home produced goods. Fixed cost in this model will be expressed as a downward shift in the home production function and a decrease in non-labour income. Examples of home-produced goods which cannot be bought in the market may be comfort and enjoyment derived from family union or parental care of children. They are represented as commodities with larger L (consumption time) in the model in the paper.

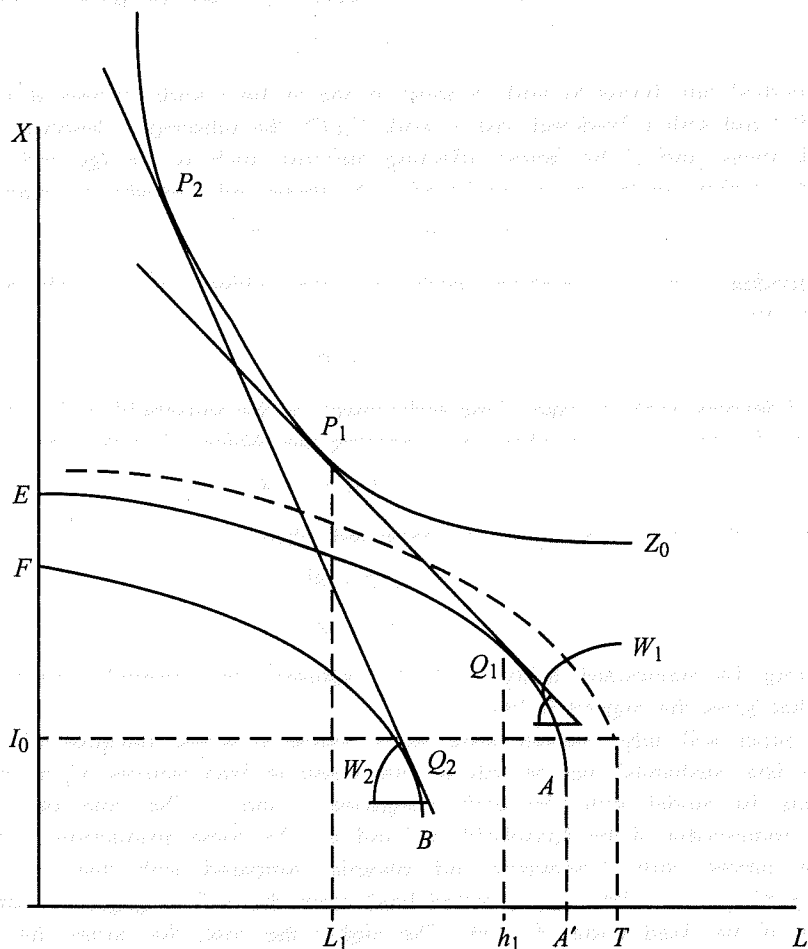


FIGURE 1. The compensating wage differential model.

income increases the probability of work category with lower time cost of work, and an increase in time endowment has the opposite effect if both X and L are normal goods.

Though the switching costs are not observed, they are revealed in each wife's work choice given different hourly wage rates facing the same person, depending on work choices. Since the model predicts that the switching cost is low for the low-wage work categories, an increase in "number of pre-school children" and "low income of husband" should not discourage work choices of household-based employment and part-time employment as much as for regular employment at firms.¹⁰⁾ On the other hand, the coefficient on "other family adult member" should be higher for the regular

10) The paper assumes that children's needs for parental time and goods are age specific and that they cannot be substituted across periods and that younger children require more parental time, other things equal.

employment if the adult member substitutes the wife's time. Fixed cost of work in the family and self-employed work should decline substantially when the husband is self-employed. The couple can coordinate their time to engage in home production, market work and home-time.¹¹⁾ To account for differences in wage levels, "years of education" and "work experience years"¹²⁾ are introduced into the equation.

3.2 Empirical specifications

Five statuses of work are considered in the following: non-labour participation (full-time mothers and wives), home-based piece-rate workers (naishokusha), family workers and the self-employed (kazokujuugyousha and jieigyoshu), part-time employees (pato arubaito) and regular employees (seishain).

Following Maddala (1983), let I_{si}^* be the indirect utility obtained from the s 's status for the i 's individual. Let the utility be decomposed into linear and non-stochastic components, $Z_{si}\beta_s$ and a stochastic component, c_{si} ,

$$I_{si}^* = Z_{si}\beta_s + c_{si} \quad (s = 1, 2, \dots, 6). \quad (8)$$

While I_{si}^* is not observable, $I_{si} = 1$ is observed if i makes the s 's choice. Otherwise, $I_{si} = 0$.

$$I_{si} = 1 \text{ iff } I_{si}^* > \text{Max } I_{ji}^* \quad (j = 1, 2, \dots, 5, s \neq j). \quad (9)$$

Let

$$e_{si} = \text{Max } I_{ji}^* - c_{si} \quad (j \neq s) \quad (10)$$

and suppose c_{si} are i.i.d with type I extreme-value distribution with cumulative distribution function given by $F(c_{si} < c) = \exp(-\exp(-c))$

Then

$$\text{Prob}(e_{si} < Z_{si}\beta_s) = \text{Prob}(I_{si} = 1) = \exp(Z_{si}\beta_s) / \left[\sum_j \exp(Z_{ji}\beta_j) \right]. \quad (11)$$

11) It was pointed out by an anonymous referee that the work selection decisions are different between wives with an affiliation to the family business and of those without. This is very plausible. Starting informal sector work such as self-employment may well require more initial resources than participating in the family business. The data, however, give no more information on such affiliation other than the husband's occupation. For example, 8 per cent of the wives with non-self-employed husbands chose to work in the family business. At the same time, dividing the females into two groups reduces sample sizes. Therefore, I assumed that all the females face the same five choices of "regular status employment", "part-time status employment", "family work or self-employment", "home-based piece-rate" and "full-time housewife", but that the cost of work in "family work or self-employment" is less for wives whose husbands are self-employed. The wage regression also showed that the difference in wage between the family work and self-employment is insignificant at the 5 per cent significance level.

12) To control for different skills and the consequent wage level females face based on past decisions, years of education and years of work were entered into the equation. The Wu-Hauseman test rejected the hypothesis that work experience is endogenous in the wage function. The adequacy of entering work experience years in the labour participation function and labour hours function is discussed in Killingworth and Heckman (1986, pp. 196-197) and in the wage function in Ishikawa and Dejima (1994).

4. The empirical results of the logit analysis

Most of the logit coefficient estimates presented in Table 4 are consistent with the predictions of the theory.

The grandmother's cohabitation interestingly increases the probability of choosing regular status employment in firms, while the choice of home-based piece-rate and non-participation is decreased. To illustrate the magnitude of the effect, the first section in the Table 5 shows the difference in the mean predicted probabilities, when grandmother = 1 and grandmother = 0 is assumed while other variables are held constant. Probability of employment with the regular status is about 15 per cent higher for the grandmother-present households, and most of the increase is met by the decrease in the full-time housewife selection, other variables held constant. This supports the hypothesis that regular status employment in a firm, though highly paid, imposes a significant burden in relation to home responsibilities while other lower paid work categories, part-time status and the informal sector employment, make it easier for market work to be combined with home duties.

Table 4 shows that a grandfather's time, on the other hand, does not seem to substitute the wife's, though it significantly increases the likelihood of becoming a family or self-employed worker. One possible interpretation for the result is that the grandfather is still the "nominal" head of the family business.

TABLE 4
THE MULTINOMIAL LOGIT ESTIMATES FOR THE CHOICE OF WORKING STATUS

	Family worker and the self- employed	Employees in regular status	Employees in part- time status	Home-based piece-rate worker
Intercept	-5.147*** (5.193)	-4.064*** (4.268)	-0.1816 (0.196)	-0.4012 (0.377)
1 = grandmother in household	-0.4745* (1.705)	1.383*** (5.413)	0.4604 (1.603)	-0.6232 (1.307)
1 = grandfather in household	0.7870** (2.566)	0.2827 (0.993)	-0.1735 (0.493)	0.1291 (0.242)
number of pre-school children	-0.4700*** (3.039)	-0.7277*** (4.611)	-0.9035*** (5.458)	-0.2469 (1.392)
number of children	0.1971 (1.551)	0.0277 (0.212)	0.1678 (1.260)	0.1963 (1.125)
income of husband	-0.00227*** (4.033)	-0.00435*** (5.499)	-0.00337*** (4.228)	-0.00207** (2.009)
education years	0.1895*** (2.693)	0.2638*** (4.052)	-0.03073 (0.460)	-0.1715** (2.004)
work experience years	0.0891*** (4.348)	0.0738*** (3.924)	0.04278** (2.267)	0.01882 (0.763)
1 = husband self- employed	2.7363*** (11853)	0.3458 (1.261)	-0.2549 (0.795)	-0.2741 (0.635)
sample size	176	156	130	64
log likelihood		1176.62		

Notes: Estimated *t*-values are in parentheses.

*the coefficient estimate is statistically significant at the 10 per cent level.

**the coefficient estimate is statistically significant at the 5 per cent level.

***the coefficient estimate is statistically significant at the 1 per cent level.

sample size of non-labour market participants 510.

TABLE 5
SIMULATION RESULTS ON WORK CATEGORY CHOICE WITH SELECTED VARIABLES

Predicted Probabilities of Work Selection			
Work status	unadjusted	Grandmother	
		in the household	not in the household
Employment in regular status	0.151	0.267	0.102
Employment in part-time status	0.125	0.133	0.124
Family worker and the self-employed	0.170	0.174	0.168
Home based piece-rate	0.061	0.030	0.075
Full-time housewife	0.492	0.396	0.530
Effect of Education			
	9 yrs	12 yrs	16 yrs
Employment in regular status	0.089	0.160	0.296
Employment in part-time status	0.147	0.119	0.076
Family worker and the self-employed	0.137	0.176	0.217
Home based piece-rate	0.010	0.055	0.021
Full-time housewife	0.527	0.491	0.390
Probability of Non-Labour Participation			
Household variable	unadjusted	The number of pre-school children	
		none	two
Husband self-employed	0.315	0.239	0.446
Husband not self-employed	0.544	0.441	0.715

Note: The average of the predicted probabilities when the variables of interest were varied across all the observations while other variables were kept constant.

An extra pre-school child reduces all the forms of labour participation, but as expected, the negative effect is more powerful for the employment in firms. The magnitude is less for work in the informal sector, especially home-based piece-rate work. Increase in the number of children, though statistically insignificant, increases labour participation, implying higher demand for goods when children grow older.

An increase in the husband's income discourages labour participation, but the effect is again, as expected, statistically significantly smaller for informal sector participation compared to regular status employment in firms. This also implies that home-time and home-production is less hampered in the household-based employment.

The "husband self-employed" dummy controls for the difference in the cost of entry to family work and self-employment opportunities,¹³⁾ showing a large increase in the family and the self-employed work selection compared to those whose husbands work in firms.

The years of education and work experience control for difference in the market

13) *F*-test and likelihood ratio test were conducted for the null hypothesis that the "husband self-employed" dummy works through the interaction with other independent variables as well as through the shift in the intercept. Interaction terms jointly zero was accepted by the *F*-test at the 5 per cent significance and was barely significant by the likelihood ratio test.

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