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OCCUPATIONAL CHOICE AND MULTIPLE JOB HOLDING IN RURAL GUJARAT, INDIA

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ABSTRACT

This paper analyses occupational choice behaviour of individuals in rural Gujarat in Western India. It examines the economic rationale for holding single or multiple jobs and undertaking self or wage employment. The analysis suggests that persons who undertake multiple jobs are younger, less educated, are faced with lower wage rates and live further away from towns. The influence of the value of physical capital on job choices is complex. The polychotomous logit model suggests that higher value of land and other assets encourage diversification into a second activity, except at a very high value of land, among the self-employed. Further disaggregation, however, reveals that while this is true for self-employed men with land, landless self-employed men prefer to specialize in a single activity. Moreover, self-employed workers with land also tend to undertake two activities in different sectors. This can be interpreted as risk-averse diversification.

KEY WORDS: Occupational Choice, Multiple Job Holding, Labor Market

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INTRODUCTION

In developed countries only a small proportion of the labor force is self employed compared to the developing countries. In the latter countries self employment is not always transitional, low earning, low status work. In the literature, many studies have modeled self employment as an explicit occupational choice with earnings profiles distinctly different from wage employment (Blaug, 1974; Fields and Schultz, 1982; Huffman, 1980; Blau, 1985; Chiswick, 1977; Vijverberg, 1982; Hill, 1983 and 1989; Henderson, 1983; Khandker, 1987; Sumner, 1981; Rees and Shah, 1986; Moore, 1983). The selection bias in the earnings (wage) equation arising from such an occupational choice, has been dealt with in a variety of ways. In these studies, however, the two types of activities are treated as alternatives and they are rarely hypothesized to be performed simultaneously by the same individual.

The issue of multiple job holdings has been addressed much less in the literature. In a developed country like the U.S. only 5.4 percent of all employed persons in 1985 held multiple jobs (Stinson, 1986). In developing countries holding more than one job is more common. The estimates vary from 27 percent for male workers in Malayasia in 1976 (Schaffner and Cooper, 1991) to 50 percent in rural Gujarat in India in 1987-88 (survey data analysed in this paper). A person holding two or more jobs has been treated in the developed countries as moonlighting, or participating in the secondary labor market. The main rationale given for holding a second job was restriction on the number of

hours worked on the first job (Shisko and Rostker, 1976). Schaffner and Cooper (1991) analyse further such rationales in a developing country context. Multiple job holding among farm families in developed countries has been the focus of some studies (Hallberg, et.al., 1991).

In this paper I focus on multiple job holding in rural India in the state of Gujarat. The possible rationales for multiple job choices are outlined in the next section. Two main reasons for diversification into a second job are restrictions on the hours of work in the first job which is below the desired labor supply, and uncertainty in income streams from the first job. In rural India seasonality of employment in agriculture and related non-agricultural activities act as a restriction on the hours in both self and wage employment. This might lead to diversification into a second wage or self employed job. Uncertainty in weather conditions and risks in production also encourage diversification into a second job whose risks are less than perfectly correlated with the first job. Since our model is a static single period model we consider the first issue of restriction on hours explicitly, but do not include uncertainty and risk directly. However, we hope that a discussion of multiple jobs in a single period will provide clues to household behavior when faced with uncertainty and risk in production and wage employment[1].

[1] Many of the concepts developed in this section are based on Schaffner and Cooper, 1991, and on discussions with Julie Schaffner.

RATIONALE FOR MULTIPLE JOB HOLDING

The standard labor supply model assumes that a worker's wage depends on human capital and is independent of hours of work (Killingsworth, 1985; Killingsworth and Heckman, 1986). This model is extended to include multiple jobs by assuming that while the marginal wage at off-farm (wage) employment is independent of hours of work, the marginal value product of time spent working on farm (self employed jobs) is downward sloping (Sumner, 1991). 'In the agricultural household model, rational individuals are assumed to participate in off-farm work when their reservation wage (for farm and home uses of time) is less than the off-farm wage-rate offered in the market' (Huffman, 1991; Singh, Squire and Strauss, 1986).

In the model outlined below the decisions regarding single or multiple and self or wage job choices are assumed to be taken simultaneously by the individual worker[2]. Five explicit occupational choices listed below are considered:

1. only one wage job;
2. only one self employed job;
3. one self employed and one wage job;
4. two self employed jobs; and
5. two wage jobs.

Another option open to a self employed person is to sell his assets and specialize in wage employment, but in that case he would be considered a wage employee for our purposes. In the utility maximization framework the person

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[2]The standard model does not consider multiple job holdings. However, Gronau (1977) formalized a distinction between home production, leisure and work in the market. The choice was between three alternatives rather than just work and leisure. The person maximizes the amount of commodity Z, which is a combination of goods and services and consumption time, subject to a budget constraint and a time constraint. This model is useful in thinking about multiple jobs such as a combination of self employment and wage employment and leisure.

chooses the total supply of labor simultaneously with the hours allocation between jobs. This choice is also guided by exogeneous factors such as individual characteristics, asset structure, job oppurtunities etc.

Labor supply decisions of the individual are viewed as a result of utility maximization subject to constraints on human time and income. The individual faces a variety of wage and non-wage job opportunities and seeks to maximize utility from leisure L, a vector of purchased goods C and a vector of factors exogeneous to current consumption decisions X, such as individual, household and regional characteristics. The utility function

$$U = U(C, L, X) \tag{1}$$

is to be maximized subject to a time constraint,

$$T = h_1 + h_2 + L \tag{2}$$

where h_1 and h_2 are days allocated to the two jobs. A second constraint is the total income received from the two jobs, which is spent on the market goods, and will for illustrative purposes be assumed to include as an optimum one self employed job and one wage job.

$$C = F(h_1, A_1) + w_2 h_2 + Y \tag{3}$$

The marginal earnings from the first self employed job, is a declining function of the days spent on it, h_1, and A_1 is a vector describing asset ownership. w_2 is the wage on the second job which is assumed to be a wage job with wages constant regardless of hours worked. Y is non labor income.

A general utility function for a person with one self employed job and one wage job can be written as

$$Z = U[F(h_1, A_1) + w_2 h_2 + Y,\ T - h_1 - h_2,\ X], \qquad (4)$$

The partial derivatives of the utility function with respect to h_1 and h_2 are zero at the maximum,

$$\frac{\partial Z}{\partial h_1} = \frac{\partial U}{\partial C}\frac{\partial F}{\partial h_1} - \frac{\partial U}{\partial L} = 0 \qquad (5)$$

$$\frac{\partial Z}{\partial h_2} = \frac{\partial U}{\partial C} w_2 - \frac{\partial U}{\partial L} = 0 \qquad (6)$$

The marginal returns to labor on the first self employed job, $\partial F/\partial h_1$, declines as more time is devoted to it (curve ABE in Figure 1), while the marginal wage on the second wage job, w_2, is constant (the straight line w_2BC).

If $w_2 < \partial F/\partial h_1$, evaluated at $h_1 = T - L$, a second wage job would not be undertaken and equilibrium would be reached at E with h* days of labor (case 2), where the marginal value of the self employed job just equals the marginal rate of substitution between leisure and income as in equation 5.

$$\frac{\partial F}{\partial h_1} = \frac{\partial U/\partial L}{\partial U/\partial C} \qquad (7)$$

This is the point where the curve ABE intersects with the labor supply curve S. The labor supply curve indicates the individual's reservation wage, or minimum wage required for an additional hour of work. The position of this curve depends on total income in the optimum and is jointly determined with equilibrium hours by the exogeneous characteristics, X. The individual will undertake a second wage job, $h_2 > 0$, if $w_2 = \partial F/\partial h_1$ (say at B), then an equilibrium is reached as in equation 6, where

$$w_2 = \frac{\partial U/\partial L}{\partial U/\partial C} \qquad (8)$$

The marginal returns to labor curve becomes horizontal at B and equals the market wage rate w_2[3]. In other words, for labor use less than or equal to the value at B, say h_1, it is better to be self employed and any additional labor use beyond h_1 is allocated to wage labor, $h_2 = H - h_1$ (case 3) where H is total time devoted to work (H = T - L).

For a person who undertakes two self employed jobs, the marginal earnings from the second job would be another declining function of the days, h_2, spent on it, $G(h_2, A_2)$, where A_2 is a second vector of assets. The general utility function can be written as

$$Z = U[F(h_1, A_1) + G(h_2, A_2) + Y,\ T - h_1 - h_2,\ X] \qquad (9)$$

The partial derivative with respect to h_1 and h_2 would be

$$\frac{\partial Z}{\partial h_1} = \frac{\partial U}{\partial C}\frac{\partial F}{\partial h_1} - \frac{\partial U}{\partial L} = 0 \qquad (10)$$

$$\frac{\partial Z}{\partial h_2} = \frac{\partial U}{\partial C}\frac{\partial G}{\partial h_2} - \frac{\partial U}{\partial L} = 0 \qquad (11)$$

At equilibrium,

$$\frac{\partial F}{\partial h_1} = \frac{\partial G}{\partial h_2} = \frac{\partial U/\partial L}{\partial U/\partial C} \qquad (12)$$

which is reached where the marginal productivity of labor on the two jobs are equal and that is equal to the marginal rate of substitution between consumption

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[3]It is assumed that entry into the market is costless. The introduction of cost involved, in terms of money and time, requires some modification of the income and time constraints (see Gronau, 1977).

and leisure. In Figure 2, this is shown geometrically as the equality between AE = BF = CH. h_1 days are spent on the first self employed job, h_2 days on the second job and total labor supply is $H = h_1 + h_2$ (case 4). As long as capital employed in one activity cannot be shifted to the other, this equilibrium can be depicted by the intersection of an aggregate demand curve $D(h_1+h_2, A_1, A_2)$, or a composite marginal productivity of labor curve for the two jobs together, and the labor supply curve S at C. It is not necessary for the marginal productivity curves to intersect for the individual to undertake two self employed jobs. This can occur due to some external factor such as seasonality of the work on the first activity.

In the context of developed countries the typical explanation for the existence of two wage jobs, with the second job being lower paying, is rationing of hours on the first job. 'An individuals' willingness to take on a second job depends on whether he can work enough hours *at his prevailing primary wage rate* to satisfy his income goals' (Shisko and Rostker, 1976). Utility has to be maximized subject to a constraint that

$$h_1 \lessapprox h_{1r} \qquad (13)$$

where h_{1r} is the hours ration determined by the employer and is lower than the desired supply of hours to the first job. The Lagrangian function for a person with two wage jobs can be written as

$$Z = U(w_1h_1+w_2h_2+Y,\ T-h_1-h_2,\ X) - \lambda(h_{1r}-h_1) \qquad (14)$$

where w_1 and w_2 are wages on the two jobs, $w_2 < w_1$, and h_1 and h_2 are days spent on the two jobs. λ is a Lagrange multiplier on the additional constraint. The partial derivatives with respect to h_1 and h_2 are

$$\frac{\partial Z}{\partial h_1} = \frac{\partial U}{\partial C} w_1 - \frac{\partial U}{\partial L} - \lambda = 0 \qquad (15)$$

$$\frac{\partial Z}{\partial h_2} = \frac{\partial U}{\partial C} w_2 - \frac{\partial U}{\partial L} = 0 \qquad (16)$$

If $\lambda = 0$ at equilibrium, the constraint is not binding, the individual undertakes only one wage job (case 1). He chooses the job which offers the higher wages, so that

if $w_1 > w_2$, $h_1 > 0$, and $h_2 = 0$, he chooses the first job with h_1 days,

if $w_2 < w_1$, $h_1 = 0$, and $h_2 > 0$, he chooses the second job with h_2 days.

The individual will undertake two wage jobs if $\lambda > 0$, $h_1 = h_{1r}$, and equilibrium is reached as in equation 16, at point D in Figure 3 (case 5).

$$w_2 = \frac{\partial U/\partial L}{\partial U/\partial C} \qquad (17)$$

In Figure 3 w_1 indicates the high wage in the first activity with a restriction on the number of days, h_{1r}, available on the job. w_2 indicates the lower wage on the second activity. The individual allocates h_{1r} days to the first high wage job and $h_2 = H - h_{1r}$ days to the second lower paying job. His marginal returns to labor curve is ABCD. At D equilibrium is reached where this curve intersects with the labor supply curve LS. For convenience the second job is assumed to be a wage job. It is also possible that the second activity is self employment, but the marginal productivity on this job is lower than the wage obtained in the first job. The marginal returns schedule for the second job would be declining between

B and D, intersecting the labor supply curve at D[4].

HYPOTHESES FOR STUDY

Three kinds of variables are hypothesized to influence occupational choice in this model:

1. Human capital: age and education;
2. Physical capital: value of land holding and value of other productive assets; and
3. External regional factors: village wage rate and distance from the nearest town.

Tentative hypotheses regarding the influence of these variables are discussed below.

According to the model of the decision regarding undertaking single or multiple jobs, either self or wage employment, depends on all the exogenous variables that enter the reservation wage equation, earnings function (for the self employed) or market wage equation (for wage employment). All the variables listed above are treated as such exogeneous variables. The reservation wage of an individual would depend on the characteristics of other members of his/her household. This has not been included in this model, but forms the basis for a subsequent paper on a matched sample of married couples.

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[4]It is, however, possible for persons to hold only one job ($h_2 = 0$), if at h_{1r}

$$w_1 > \frac{\partial U/\partial L}{\partial U/\partial C} > w_2$$

In figure 2, this occurs if the supply curve passes through the segment BC of the marginal returns schedule. But in the data we cannot distinguish between these single job holders and the earlier ones with labor supply schedules between A and B.

The effects of human capital on the wage labor participation decision of farm operators or the multiple job holding decision are ambiguous. 'Human capital enhances an individual's performance in farm operations, thereby increasing the shadow value of labor. The value of off-farm labor is similarly increased. The actual effects on the participation decision is left as an empirical issue' (Lass, Findeis and Hallberg, 1991). Among wage employees with no assets, better educated workers may have a higher reservation wage and may also be expected to have a higher wage offer. Only one wage job is likely to be the preferred choice unless hours worked as wage earners are rationed.

Asset ownership may encourage single self employed jobs. Higher levels of physical capital (asset ownership) would imply a higher marginal productivity curve on the first job. The income effect of the higher asset value may also raise the reservation wage and shift the labor supply curve upwards reducing the need for a second job. To the extent that asset accumulation occurs with age, single jobs may be associated with higher age.

An increase in the wage rate may reduce the supply of labor if there is a backward bending supply curve, i.e., the income effect outweighs the compensated wage effect. An increase in the wage on the second job may reduce the number of days supplied to it because the income needs are satisfied with fewer hours of work. Obviously it is difficult to predict the exact position of the curves, but we have many reasons to expect the backward bending curve to emerge for persons engaged on more hours of work at that wage.

For self employed persons who do undertake a second wage job an increase in the

market wage could reduce days supplied to self employment and increase market work. The effect on leisure is indeterminate because the income effect would tend to increase it while the substitution effect would reduce it. The exact position of the labor supply curve is not clear.

Employment opportunities arising from access to a nearby town together with possibly higher wage levels in the urban areas could be hypothesized to encourage single wage and salaried jobs.

DATA DESCRIPTION

Gujarat is an industrially and agriculturally developed state located in the western part of India. There are, however, significant intra-state variations in levels of industrialization and agricultural development. A significant part of the state is semi-arid with limited irrigation facilities. Bulk of the agricultural activity in this region is undertaken during July to January, the official 'monsoon' and winter seasons.

A primary survey was conducted in thirty villages belonging to five districts of Gujarat state in India in 1988-89. 3760 households were selected using a stratified random sample. The households in each village were stratified into four categories, viz., cultivators, agricultural laborers, household industry (including skilled workers) and others. Information on individual and employment characteristics of all members of the household and household assets was collected for the year 1987-88, which was a drought year. This forms the data for estimating the occupational choice model in this study.

A major limitation of these data was that no information was collected on wages and earnings of individuals. Hence it was not possible to estimate an earnings or wage function. Further, no information was obtained on the hours of work in each job. Hence an hours of work equation could not be estimated.

The major merit of these data was detailed information on multiple activity choices. Hence these data are used to study the determinants of occupational choice in rural India, in terms of single and multiple jobs and combinations of wage and self employed jobs.

About 53 percent of adult male workers (above 14 years and excluding students) and 61 percent of adult women workers held more than one job in the 30 sample villages of Gujarat in the agricultural year 1987-88 (Table 1). This presents a strong case for analysing the determinants of multiple job holding in India. The percentage of individuals holding only one job was highest (about 73 percent) among male salaried employees, followed by the self employed (44 percent) and the wage employed (37 percent)(Table 1). Among the female workers, the number of salaried employees was small (118). The percentage of female wage workers holding only one job was the lowest (34 percent).

The sample means of the explanatory variables used in the models are presented in Table 2 by sex and alternative employment status groups.

THE OCCUPATIONAL CHOICE MODEL AND STATISTICAL TESTS

The standard models of consumer behaviour are based on the assumption that it is possible for the consumer to make continous substitution of one good (or characteristic) for another through market transactions. However, many important choices that an individual makes are discrete, such as occupational choice (Pudney, 1989).

In general, the reduced form of the occupational choice equation for each individual is derived from an indirect utility function (V) which is obtained by the constrained maximization of the utility function. V_{ij} is the maximum utility attainable for individual i if he chooses the j^{th} occupational status. This indirect utility function can be decomposed into a non-stochastic component (X) and stochastic component (ϵ)

$$V_{ij} = \beta_j X_i + \epsilon_{ij} \qquad (18)$$

X is a vector of individual characteristics (age and education), household characteristics (value of land holding and value of other productive assets) and regional characteristics (a village wage variable and distance from the nearest town). The probability that the i^{th} individual will choose the j^{th} activity status is

$$P_{ij} = Pr(V_{ij} \succ V_{ik} \text{ for } k \neq j) \qquad (19)$$

If the stochastic components have independent and Weibull distributions, the choice model is a multinomial logit. The probability that the i^{th} individual chooses the j^{th} activity status reduces to

$$P_{ij} = \frac{\exp(\beta_j X_i)}{\sum_{kej} \exp(\beta_k X_i)} \qquad (20)$$

McFadden (1974) suggested a 'conditional logit model' which considers the effects of the characteristics of the choice and the individual agent in the determination of the choice probabilities (Domencich and McFadden, 1975). The multinomial logit model considered here make the choice porobabilities dependent on individual characteristics only (Schmidt and Strauss, 1975; Maddala, 1983). The weakness of the multinomial logit model is that the probability of any pair of states depends exclusively on characteristics of the two states concerned, and is independent of the number and nature of all other states that are simultaneously considered. The odds ratio is therefore not affected by the addition or deletion of an alternative. This property is known as independence from irrelevant alternatives (IIA) (Cramer, 1991).

To analyse the determinants of occupational choice four models are specified (Chart 1). The first model is a simple dichotomous choice between labor force participation and remaining outside the labor force (non-worker status). The second model poses a trichotomous choice of non-work, one job only and more than one job. The third model introduces the choice of self employment and wage employment as single and multiple job choices. And finally the fourth model distinguishes between the choice to work in two jobs in the same or different sectors (agriculture and non-agriculture). At each stage, where a new alternative is introduced, a statistical test for whether the subset of new alternatives can be treated as a single state is conducted.

If the original model had two choices or two states, at each stage (each new model) we are introducing a new distinction within state j. This will always lead

to an extended model with (j+1) states, two new states j_1 and j_2 being substituted for j. If the new distinction is arbitrary and irrelevant then j_1 and j_2 have the same regressor coefficients, which are those of their parent state; but their intercepts differ (Cramer and Ridder, 1991). To test for the pooling of states for each new logit model we therefore need to test for the equality of their logit regressor coefficient apart from the intercept. This can be done with a likelihood ratio test. The null hypothesis is that

$$\beta_{j1} = \beta_{j2} = \beta_j$$

The test statistic is,

$$LR = 2\{ \text{Log } \hat{L} - \text{Log } \hat{L}_R\} \qquad (21)$$

where log $\hat{L}$ is the maximum log likelihood of the original model and $\hat{L}_R$ the maximum log likelihood if the estimates are constrainted as in the null hypothesis. LR is distributed as a chi-square variate with k degrees of freedom where k is the number of restrictions implied by the null hypothesis. Log $\hat{L}$ is readily available, but $\hat{L}_R$ requires constrainted estimation which is laborious. However, Cramer and Ridder, 1991, present a simple method to compute it and a complete description of the above methodology.

A second method to test for the validity of choices in each model is a Wald Test. The null hypothesis is $\beta_{j1} = \beta_{j2}$, where only the slope coefficients are tested and not the intercept.

For comparison of the empirical results the marginal effects or partial derivatives are computed and then converted into quasi-elasticities. The partial derivative indicates the impact of the independent variable X on the probability of choice j. To make this independent of the unit of measurement, the quasi-

elasticities (η_{jk}) are evaluated at the sample means (Cramer, 1991).

$$\eta_{jk} = X_k \frac{\partial P_j}{\partial X_k} \qquad (22)$$

where j indicates the activity choices and k the elements of the independent variable vector X. η_{jk} indicates the percentage point change in P_j upon a one percent increase in X_k. These measures satisfy

$$\sum_j \eta_{jk} = 0 \qquad (23)$$

Quasi-elasticities are superior to the β coefficients and to derivatives by their ease of interpretation, but like their derivatives they too, may change sign as well as value when they are evaluated at different points. Quasi-elasticities are reported in parentheses in the tables.

A likelihood ratio index or a coefficient of determination can be defined which is analogous to the least squares multiple correlation coefficient,

$$\rho^2 = 1 - \frac{L(\beta)}{L(\beta_o)} \qquad (24)$$

EMPIRICAL RESULTS

Model 1 and 2

The results of the dichotomous and the trichotomous logit equations are presented in Tables 3a and 3b. The model is estimated separately for males and females to see if there are any significant differences in the determinants of choices by sex. The choice of not working is omitted as a reference category to identify the model in both cases.

The test statistic LR is constructed for testing the parameter restrictions

$\beta_{\text{one job}} = \beta_{\text{two jobs}}$ in the trichotomous model. This test indicates, at the .005 level of significance, a value of 22.0 with 8 degrees of freedom. The LR is above this level in the male equation (689 in Table 3a) and the null hypothesis is rejected at any conventional level of significance. Thus the trichotomous model does not collapse into the dichotomous model and provides further insight into the participation decision. The Wald Test, also a chi-square with 8 degrees of freedom, rejects the null hypothesis of parameter restrictions in the trichotomous model as well.

The female participation decision also appears to be a trichotomous choice rather than a dichotomous one. The LR and Wald test statistic clearly rejects the null hypothesis that $\beta_{\text{one job}} = \beta_{\text{two jobs}}$. The dichotomous model misspecifies the underlying choice framework. The female dichotomous occupational choice decision (Table 3b) is less well explained by the model than is the male decision (ρ^2 is smaller). However, the trichotomous model equally well explains the male and female choices (ρ^2 's are similar).

The results of models 1 and 2 are discussed in the next section along with the results of model 3 which is of primary interest to us.

Model 3

The third model disaggregates the one job and two job choices further into self employed and wage jobs. We consider five activity choices, non-work, self employment as a single activity (se), wage employment as a single activity (we), primarily self employment with either self or wage employment as a second job (seow), primarily wage employment with either self or wage employment as a second

activity (weow). The results are presented in Tables 4a and b. As previously, the choice of not working is omitted as a reference category to identify the model.

The polychotomous occupational choice model equally well explains the male and female job choices as indicated by the ρ^2 for the two equations. The LR and Wald test statistics are computed for the male and female equations to check whether the parameters in the two specifications are equal. The null hypothesis is as follows:

$$\beta_{se} = \beta_{we} = \beta_{onejob} \qquad \beta_{seow} = \beta_{weow} = \beta_{twojobs}$$

The test indicates, at the .005 level of significance, a value of 32.0 with 16 degrees of freedom. The LR and Wald statistics are clearly above this level in both the male and female equations and the null hypothesis is rejected. Thus the polychotomous model is a valid specification of multiple activity choices.

Self employment is regarded as being more risky than paid employment so that attitudes to risk matter in the occupational choice. In the context of developed countries, it is hypothesized by some authors that a less risk-averse individual is more likely to choose self employment (Rees and Shah, 1986). Another hypothesis is that the choice of self-versus-wage employment is based on 'managerial ability' (Blau, 1985).

The wage employed group in this model includes both casual daily wage earners and persons with regular salaried jobs. Obviously this is not a homogeneous group with the latter having much higher levels of education than the former. The casual daily workers, in the developed country context, constantly face the risk of unemployment. In such a situation the choice of occupation is more likely to

be based on the asset position (or educational level) of the individual rather than attitudes to risk. Blau (1985) also found that land rather than 'managerial ability' was an important factor in determining the choice into self employment in agriculture in rural Malaysia.

Human Capital: A major similarity between the dichotomous and trichotomous participation decision for males is that labor force participation is higher in the younger age groups (Table 3a). However, the trichotomous model suggests that younger workers are more likely to hold two jobs than a single job. A large positive elasticity of the younger age group on holding two jobs is observed. In the older age groups holding a single job is the preferred choice. The average age at which the probability of multiple jobs peaks is 34 years. It is perhaps the age at which young men get settled into their jobs and are able to give up a second job if they had one. The results are more or less similar for women in the two models (Table 3b). The age at which multiple job holdings for women peak is lower, at 31 years, as compared to the men.

In model 3 also, all the job choices show a higher participation in the younger age groups, and a tapering off in the older age groups for both male and female workers (Tables 4a and b). When the choices are split into self and wage employed jobs, the probability of self employment as a single activity is found to be preferred among the older men (quasi-elasticity is positive for this choice only). The turning point for the activity choice is 37 years among self employed men while it is 33 years among the wage employed men. The corresponding ages for self employed women is 35 years and for wage employed women is 26 years.

In the trichotomous model education has a significant negative effect on holding two jobs. The elasticities also indicate a large positive impact of education on holding only one job. This could occur due to various reasons as hypothesized earlier. Education has a significant negative impact on female participation not just on holding two jobs as observed in the case of males. However, the quasi-elasticity does show a small positive influence of education on holding a single job in the case of women.

Higher levels of education are observed to lead to single job choices for male workers in model 3 also (Table 4a). The positive impact of education on the choice of a wage job is however dampened by the heterogenous nature of the group discussed earlier[5]. Education has a positive influence on the choice of self employment as a single activity. It is hypothesized to enhance the individual performance directly or indirectly through better access to capital among the educated workers.

Among female workers, however, education had a significant negative influence on all job choices. A small positive elasticity is noted for single self employed jobs alone (Table 4b).

Physical Capital: Physical capital variables used in the analysis are the value of land holdings and value of other productive assets excluding land. The dichotomous and trichotomous models are similar in terms of a positive influence of the value of other productive assets on participation. Both single and

[5]If the choice is restricted to regular salaried jobs the positive impact of education is significant. The results of this model are not reported here.

multiple job holdings are similarly affected. The elasticities however indicate a positive impact on two job holdings rather than one.

It was hypothesized earlier that a higher value of physical assets would encourage single jobs. However, this does not seem to be the case. Two possible reasons for this are possible. The first, included in our theoretical model, is the seasonality of work leading to restriction on the number of days in the first job. The second possible reason, not included in the model, is uncertainty or risk in the first activity which might encourage diversification into a second job.

The value of land holding variable was introduced in quadratic form to see if it influences the emergence of a second job at low levels, while increasing the chance of specialization in self employment at higher levels. The trichotomous model suggests that the inverted U shaped relationship is significant for multiple job holding (Tables 3a and b). However, it is only a few large land holders (with value of land around Rs. 630,000) who undertake only one activity. Thus again physical assets, in terms of land, encourage diversification into a second job rather than foster specialization by relaxing the capital constraint.

The inverted U-shaped relationship for the value of land variable is significant for the primarily self employed workers who undertake a second activity (Tables 4a and b). However, as observed in the case of multiple job holders in model 2, the turning point is again at a very high value of land (Rs. 625,000 for men and Rs. 638,000 for women). That is, only a few large land holders undertake only one activity. Among the primarily self employed women, however, a higher value of

land appears to encourage participation in a single activity as well. The value of productive assets other than land has a positive impact on both single and multiple jobs among the self employed. Thus, a higher value of physical capital does not necessarily lead to specialization even among the self employed. The relationship appears to be more complex than hypothesized.

The relationship observed for the value of land variable suggests that the job choices of the landed and landless persons may be different. Among the male workers 2853 are landless while 3117 have some operational land holding. Among the landless 68 percent hold a single job, while about 73 percent of the landed males undertake multiple jobs. Of the landed males, 1601 are self employed and of these 408 (25 percent) undertake only a single activity. Among the landless males 849 are self employed of whom 660 (78 percent) undertake only a single job.

The preferred choice of the landless males is a single job. Moreover, it appears that the landed primarily self employed men prefer multiple jobs, while the landless self employed men prefer single jobs. Among the landed self employed it is perhaps the large land holders who specialize in one activity. This disaggregation helps to explain the complex job preferences of the self employed and what appears as a significant U-shaped relation to the value of land.

External Regional Factors: To capture the impact of access to and availability of employment opportunities, distance from the nearest town is included in the analysis. It has a positive influence on labor participation. The trichotomous model however suggests that the further is the village from a town the greater is the chance of multiple job holding. Similar results are obtained in the case

of wage and self employment as primary choices (Tables 4a and b). This is surprising since one would expect more opportunities for jobs closer to town. However, as noted earlier, higher wage levels in urban areas could explain this choice. Further, multiple job preferences in distant villages probably reveals the need for diversification of activities to compensate for lower income levels in these remoter areas and reduce uncertainties from one job alone.

The village wage had a negative impact on multiple job holdings. The elasticity shows that the effect of the village wage on a single job was positive as hypothesized (Tables 3a and b). The village wage variable also has a negative influence on multiple jobs among primarily self and wage employed men (Tables 4a and b). Among women workers though both single and multiple job choices are discouraged by a higher village wage. The elasticities of village wage however show that multiple jobs among men and women are more common the lower the village wage.

To sum, the trichotomous model provides suggestive insights into household behaviour when faced with seasonality of work and uncertainty in rural India. Persons who undertake single jobs appear to be older, better educated or have a very high value of land or other productive assets. Equipped with these sources of human and physical capital these individuals are hypothesized to have higher income streams and are better insulated against uncertainties in their fields of activity. Higher levels of physical capital, however, appears to encourage diversification into a second job. Lower wages and greater distance from the towns also encourage multiple jobs. This can be seen as diversification to increase income levels and deal with uncertainties.

The polychotomous model suggests that higher value of physical capital (land and other assets) among the self employed need not lead to specialization. However, among the self employed men without land specialization does occur. It is likely that the value of other assets variable captures agricultural assets better than non-agricultural assets and hence shows a positive relation with multiple jobs. Among primarily wage employed persons, younger, less educated persons faced with lower wages undertake multiple jobs. In both cases greater distance from the town appears to encourage diversification of occupations. The policy significance of these results are discussed in the conclusion.

Model 4

In the final model we have further split the choice of multiple jobs among self and wage employed persons into whether they undertake two activities in the same or different sectors. The sectors are defined broadly as agriculture and non-agriculture. There are six choices in this model. The six groups consist of non-workers, persons with only one job, primarily self employed workers with two jobs in different sectors (sed) or in the same sector (ses), and primarily wage employed workers with two jobs in different sectors (wed) or in the same sector (wes). The underlying assumption here is that persons undertake two jobs in different sectors to reduce uncertainties and diversify risks. The results of the male equation are presented in Table 5. The LR test statistic for the female equation could not be computed since the pooled model did not converge. The results are presented in Appendix Table 1 and are more or less similar to the male equation.

The LR and Wald test statistics are computed for the following null hypothesis:

$$\beta_{sed} = \beta_{ses} = \beta_{seow} \qquad \beta_{wed} = \beta_{wes} = \beta_{weow}$$

The test statistics are chi-squares with 16 degrees of freedom. The null hypothesis is rejected at any conventional level of significance. Model 4 is a valid specification and provides insight into another dimension of diversification by self employed workers.

In general the results of this model are similar to that observed for the earlier ones. However, one significant result which provides insight into risk averse behaviour of self employed persons is highlighted below.

In the earlier models it was observed that the primarily self employed men with land preferred multiple jobs, except at a very high value of land. In the extended model this relationship is found to be significant for self employed workers undertaking two jobs in different sectors. The value of land at which multiple jobs peak is again very high at about Rs. 618,000. Only few large land holders specialize in one activity. The value of other productive assets has a significant positive effect on both self and wage employed men who undertake a second activity in a different sector. Thus self employed workers with land not only prefer multiple jobs, but also tend to diversify into activities in different sectors. This is perhaps an attempt to diversify risks and reduce uncertainties, particularly in agriculture.

CONCLUSIONS

A large proportion of the individuals in rural India undertake more than one economic activity. Such diversification could occur due to seasonality of work or uncertainties and fluctuating incomes from a single agricultural or non-agricultural activity. The single activity model ignores the fact of multiple job choices among the rural population. It misses the possible rationales for such choices and consequently may be misleading for policy.

The polychotomous model suggests that, persons who undertake multiple jobs are younger, less educated, are faced with lower wage rates and live further away from towns. The influence of the value of physical capital on job choices is complex. Higher value of land and other assets encourage diversification into a second activity, except at a very high value of land, among self employed men. Further disaggregation, however, reveals that while this is true for self employed men with land, landless self employed men prefer to specialize in a single activity. Finally, model 4 suggests that the self employed workers with land also tend to undertake two activities in different sectors. This can be interpreted as risk-averse diversification.

Overall, the analysis in this paper suggests that the labor market in developing countries is complex. Besides, the occupational choices observed in rural Gujarat also reflect the specific agro-climatic conditions of this state, described earlier, and the drought conditions prevailing in the year of survey.

The multiple job holding model directs attention towards the problems involved in production activity in rural India. Some of these are low productivity on

self employed jobs, dependence on the weather in agriculture and some related non-agricultural jobs, low wages in the rural sector and lack of sufficient wage employment. The model analyses determinants of multiple job choices which emphasize the relevance of some policies needed to improve productivity and reduce risks in rural activities. These include policies to:

1. Improve educational facilities at all levels to increase productivity and raise wage levels, and
2. Develop infrastructure, e.g., roads and public transportation facilities to increase the mobility of workers in remote villages to enable them to take advantage of job opportunities in towns and other villages.

Besides, uncertainties and risk in production could be reduced and restriction on the days of self employed activity could be relaxed through developing new technologies in agricultural and non-agricultural activities, and strengthening systems of credit to help investment in physical capital.

REFERENCES

Blau, David M., 1985, 'Self-Employment and Self-Selection in Developing Country Labor Markets,' **Southern Economic Journal**, 52 (2), October, pp 351-363.

Blaug, Mark, 1974, 'An Economic Analysis of Personal Earnings in Thailand,', **Economic and Cultural Change**, 23, 1, October, pp 1-32.

Chiswick, C.U., 1976, 'On Estimating Earnings Functions for LDCs,' **Journal of Development Economics**, 4, pp 67-78.

Cramer, J.S., 1991, **An Introduction to The Logit Model for Economists**, Edward Arnold, Hodder and Stoughton Limited, U.K.

Cramer, J.S. and Ridder G., 1991, 'Pooling States in the Multinomial Logit Model,' **Journal of Econometrics**, 47, pp 267-272.

Domencich, T.A. and D. McFadden, 1975, **Urban Travel Demand-A Behavioral Analysis**, North Holland Publishing Co.

Fields, Gary S., and T. Paul Schultz, 1982, 'Income-Generating Functions in a Low Income Country: Columbia,' **The Review on Income and Wealth**, 28, 1, March, pp 71-87.

Gronau, Reuben, 1977, 'Leisure, Home Production, and Work-Theory of the Allocation of Time Revisited,' **Journal of Political Economy**, 85:6, pp 1099-1123.

Hallberg, M.C., Jill L. Findeis and Daniel A. Lass, (eds) 1991, **Multiple Job Holding Among Farm Families**, Iowa State University Press, Ames.

Henderson, James W., 1983, Earnings Functions for the Self-Employed,' **Journal of Development Economics**, 13, pp 97-102.

Hill, Anne M., 1983, 'Female Labor Force Participation in Developing and Developed Countries: Considerations of the Informal Sector,' **Review of Economics and Statistics**, 65, pp 459-468.

Hill, Anne M., 1989, 'Female Labor Supply in Japan: Implications of the Informal Sector for Labor Force Participation and Hours of Work,' **Journal of Human Resources**, 24, pp 143-161.

Huffman Wallace E., 1980, 'Farm and Off-Farm Decisions: The Role of Human Capital,' **The Review of Economics and Statistics**, Vol. LXII, No. 1, February, pp 14-23.

Huffman Wallace E., 1991, 'Agricultural Household Models: Survey and Critique,' in Hallberg et.al. (eds).

Khandker S.R., 1987, 'Labor Market Participation of Married Women in Bangladesh,' **The Review of Economics and Statistics**, 69, 3, pp 536-541.

Killingsworth, M.R., 1985, 'A Simple Structural Model of Heterogeneous Preferences and Compensating Wage Differentials', In R. Blundell and I. Walker (eds), **Unemployment, Job Search and Labor Supply**, Cambridge University Press.

Killingsworth, M.R. and J. Heckman, 1986, 'Female Labor Supply: A Survey', In O. Ashenfelter and R. Layard, **Handbook of Labor Economics, VolumeI**, Elsevier Science Publishers.

Lass, Daniel A., Jill L. Findeis and Milton C. Hallberg, 1991, 'Factors Affecting the Supply of Off-Farm Labor: A Review of Empirical Evidence', in Hallberg et.al. (eds).

Maddala, G.S., 1983, **Limited Dependent and Qualitative Variables in Econometrics**, Cambridge University Press.

Mc Fadden, Daniel, 1974, 'Analysis of Qualitative Choice Behavior,' **Frontiers in Econometrics**, Edited by Paul Zerembka, New York, Academic Press.

Moore, Robert L., 1983, 'Employer Discrimination: Evidence from Self-Employed Workers,' **The Review of Economics amd Statistics**, 65, pp 496-501.

Pudney, Stephen, 1989, **Modelling Individual Choice: The Econmetrics of Corners, Kinks and Holes**, Basil Blackwell.

Rees, Hedley and Shah, Anup, 1986, 'An Empirical Analysis of Self-Employment in The U.K.,' **Journal of Applied Econometrics**, 1,pp 95-108.

Schaffner Julie A.and Joyce R. Cooper,1991,'Multiple Job Holdings in Developing Countries: The Case of Malaysia,' Paper presented at the Northeast Universities Development Consortium Conference, October.

Schmidt, P. and R.P. Strauss, 1975, 'The Predictions of Occupation Using Multiple Logit Models', **International Economic Review**, 16(2), pp 471-486.

Singh, I., Squire L. and Strauss J., 1986, **Agricultural Household Models: Extensions Application and Policy**, World Bank, John Hopkins University Press.

Sishko Robert and Bernard Rostker, 1976, 'The Economics of Multiple Job Holding,' **American Economic Review**, Vol. 66, No. 3, pp 298-308.

Stinson, John F. Jr., 1986, 'Moonlighting by Women Jumped to Record Highs,' **Monthly labor Review**, Vol. 109, No. 11, pp 22-25.

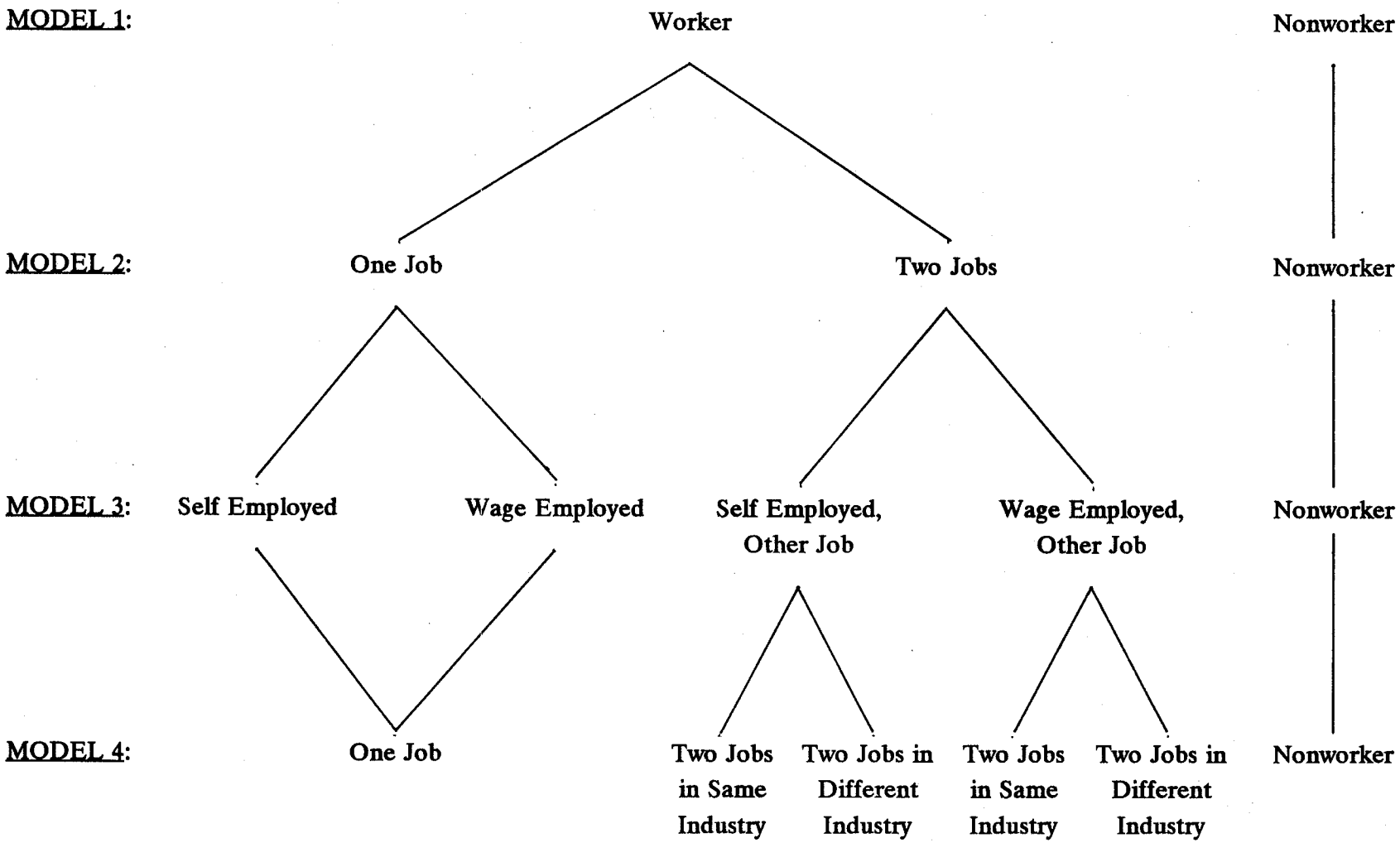
Sumner, Daniel A., 1981, 'Wage Functions and Occupational Selection in a Rural Less Developed Country Setting,' **The Review of Economics and Statistics**, 33:4, pp 513-519.

Sumner, Daniel A., 1991, 'Useful Directions for Research on Multiple Job Holding Among Farm Families,' in Hallberg et.al. (eds).

Vijverberg, Wim P.M., 1986, 'Consistent Estimates of the Wage Equation when

Individuals Choose Among Income Earning Activities,' **Southern Economic Journal**, 52, April, pp 1028-1042.

CHART OF OCCUPATIONAL CHOICE MODELS



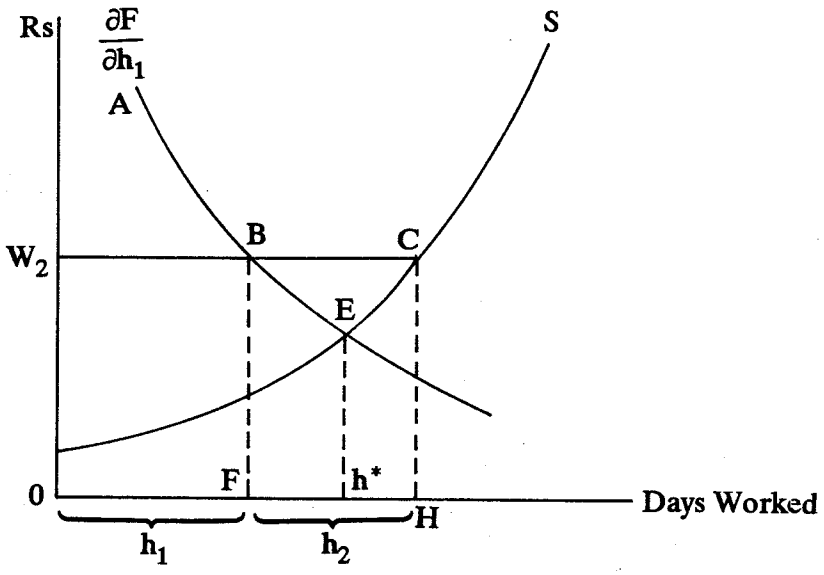


FIGURE 1

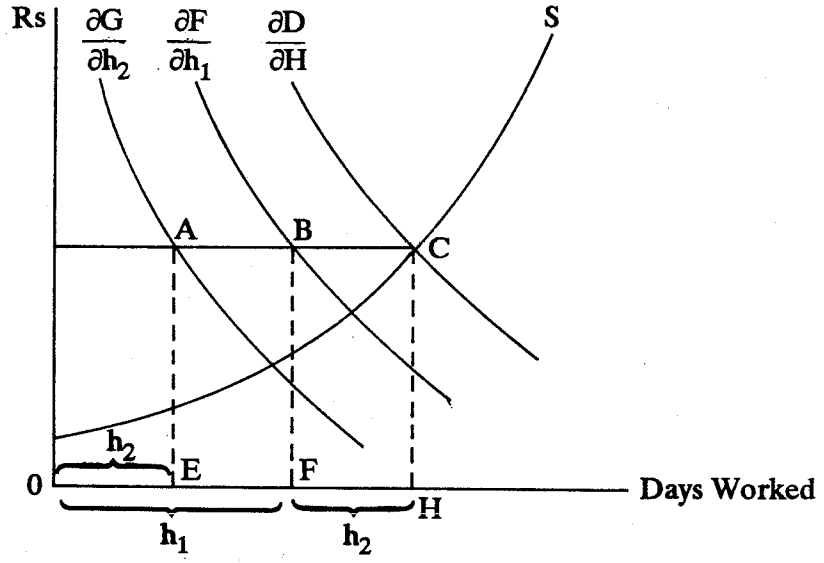


FIGURE 2

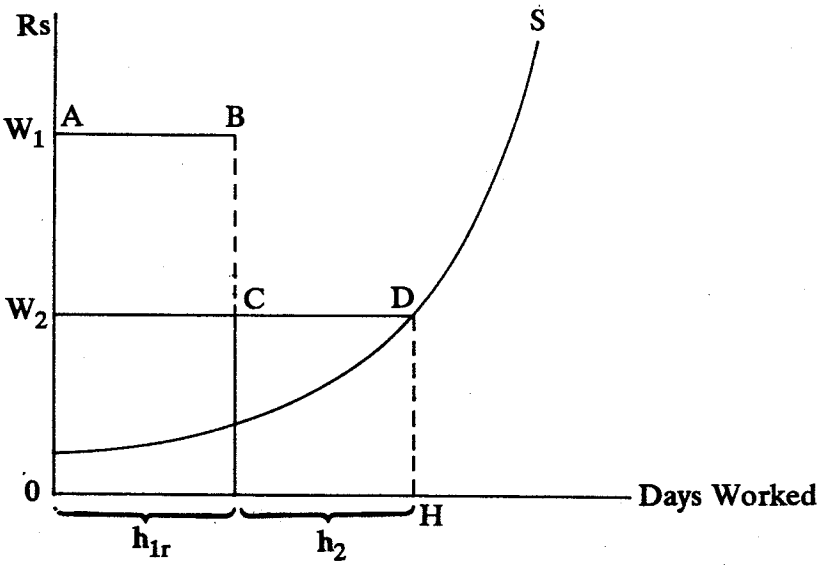


FIGURE 3

Table 1: Occupational Choice by Activity 1 and 2

Activity Status 1	Activity Status 2: Self Employed	Wage Employed	Salaried	Nonworker	Total
			MALE		
Self Employed	777	580	25	1068	2450
	31.7[a]	23.7	1.0	43.6	
	41.8[b]	58.4	40.9	24.9	
Wage Employed	818	368	29	715	1930
	42.4	19.1	1.5	37.1	
	44.0	37.1	47.5	23.4	
Salaried	263	45	7	857	1172
	22.4	3.8	0.6	73.1	
	14.2	4.5	11.5	28.0	
Nonworker	0	0	0	418	418
	0.0	0.0	0.0	100.0	
	0.0	0.0	0.0	13.7	
Total	1858	993	61	3058	5970
			FEMALE		
Self Employed	1088	388	4	969	2449
	44.4	15.8	0.2	39.6	
	59.9	56.5	25.0	27.1	
Wage Employed	711	290	11	531	1543
	46.1	18.8	0.7	34.4	
	39.2	42.2	68.7	15.0	
Salaried	15	9	1	93	118
	12.7	7.6	0.8	78.1	
	0.8	1.3	6.2	2.6	
Nonworker	0	0	0	1937	1937
	0.0	0.0	0.0	100.0	
	0.0	0.0	0.0	54.9	
Total	1814	687	16	3530	6047

[a]Indicates row percentages.
[b]Indicates column percentages.

Table 2: Sample Means by Employment Status

	Male		Female	
Model 1 Variables	Nonworker (418)	Worker (5550)	Nonworker (1937)	Worker (4110)
Age	53.2	35.0	40.9	33.1
Education	2.4	2.7	2.2	1.6
Value of Land	32452.5	28860.4	20365.3	31466.3
Value of Assets	7409.6	7915.6	5325.9	9055.6
Distance from Town	13.2	14.6	13.0	15.4
Village Wage	9.7	9.5	10.0	9.3
	Male		Female	
Model 2 Variables	One Job (2640)	Two Jobs (2912)	One Job (1593)	Two Jobs (2517)
Age	35.1	34.8	33.6	32.7
Education	3.0	2.4	1.9	1.5
Value of Land	23711.7	33542.8	18184.1	39879.1
Value of Assets	6334.8	9354.4	5669.5	11203.8
Distance from Town	13.0	16.0	14.2	16.3
Village Wage	9.9	9.1	9.7	9.1
	Male			
Model 3 Variables	SE (1068)	WE (1572)	SE,OW (1382)	WE,OW (1530)
Age	39.4	32.2	36.7	33.1
Education	2.9	3.0	2.5	2.3
Value of Land	32273.7	11635.8	47769.4	27078.2
Value of Assets	11818.6	2633.0	13435.5	5629.8
Distance from Town	14.3	12.1	16.0	16.0
Village Wage	9.8	9.9	9.0	9.2
	Female			
Variables	SE (969)	WE (624)	SE,OW (1480)	WE,OW (1037)
Age	35.5	30.8	34.1	30.7
Education	2.1	1.6	1.7	1.2
Value of Land	25602.7	6653.0	48095.6	28138.3
Value of Assets	8376.6	1463.8	15387.6	5228.6
Distance from Town	13.9	14.6	15.8	16.8
Village Wage	9.6	9.9	9.2	9.0
	Male				
Model 4 Variables	ONEJ (2640)	SED (930)	WED (1061)	SES (452)	WES (469)
Age	35.1	37.5	33.6	35.0	32.1
Education	3.0	2.6	2.3	2.3	2.2
Value of Land	23711.7	60356.6	31814.6	21870.9	16363.1
Value of Assets	6334.8	16822.0	6576.0	6467.6	3489.1
Distance from Town	13.0	15.6	15.6	16.8	16.8
Village Wage	9.9	9.1	9.0	8.6	9.6

Figures in parentheses are number of observations.

Table 3a: Maximum Likelihood Dichotomous and Trichotomous Logit Estimates of Model 1 and 2; Male

	Model		
	(1)	(2)	
	Participation	One Job	Two Jobs
Intercept	.595 (1.31) --	-.229 (-.50) --	-.271 (-.57) --
Age	.186 (10.14) [.290]	.155 (8.27) [-.483]	.231 (11.65) [.806]
Age Squared (10^{-2})	-.273 (-13.48) [-.180]	-.231 (-11.31) [.277]	-.334 (-14.95) [-.478]
Education	-.049 (-1.08) [-.006]	.093 (1.98) [.194]	-.222 (-4.67) [-.201]
Value of Land (10^{-4})	-.004 (-.55) [-.001]	-.013 (-1.83) [-.042]	.049 (5.15) [.044]
Value of Land Squared (10^{-9})	-.000 (-.41) [-.000]	.002 (.78) [.027]	-.005 (-6.21) [-.029]
Value of Assets (10^{-3})	.011 (2.84) [.003]	.007 (1.89) [-.005]	.011 (2.79) [.008]
Distance from Town	.021 (2.60) [.013]	.001 (.08) [-.147]	.045 (5.37) [.162]
Village Wage	-.035 (-.163) [-.014]	.017 (.75) [.228]	-.088 (-3.94) [-.244]
Log Likelihood	-1153.13	-46.50.24	
χ^2	722.71	1413.21	
ρ^2	0.24	.13	
LR		689.01	
Wald Test		594.56	

Figures in parentheses are asymptotic *t*-ratios.
Figures in square bracketsd are quasi-elasticities.
Nonparticipation is the residual choice.

Table 3b: Maximum Likelihood Dichotomous and Trichotomous Logit Estimates of Model 1 and 2; Female

	Model		
	(1)	(2)	
	Participation	One Job	Two Jobs
Intercept	.168 (.67) --	-.710 (-2.44) --	-.451 (-1.56) --
Age	.139 (12.14) [1.027]	.110 (8.41) [.114]	.167 (12.34) [.959]
Age Squared (10^{-2})	-.221 (-15.62) [-.689]	-.176 (-10.83) [-.079]	-.264 (-15.41) [-.640]
Education	-.495 (-19.52) [-.188]	-.334 (-11.52) [.013]	-.646 (-21.35) [-.211]
Value of Land (10^{-4})	.018 (3.33) [.011]	-.004 (-.49) [-.012]	.031 (5.17) [.022]
Value of Land Squared (10^{-9})	-.002 (-2.52) [-.009]	.002 (.18) [.001]	-.003 (-4.08) [-.002]
Value of Assets (10^{-3})	.012 (5.37) [.020]	.007 (2.37) [-.004]	.016 (6.70) [.025]
Distance from Town	.036 (8.24) [.109]	.017 (3.50) [-.035]	.051 (10.55) [.148]
Village Wage	-.072 (-6.36) [-.142]	-.031 (-2.34) [.058]	-.105 (-8.40) [-.207]
Log Likelihood	-3157.28	-5732.27	
χ^2	1269.74	1608.83	
ρ^2	.17	.12	
LR		339.09	
Wald Test		296.41	

Figures in parentheses are asymptotic *t*-ratios.
Figures in square bracketsd are quasi-elasticities.
Nonparticipation is the residual choice.

Table 4a: Maximum Likelihood Polychotomous Logit Estimate of Model 3: Male

	One Job		Multiple Jobs	
	Self Employed	Wage Employed	Self Employed with Second Job	Wage Employed with Second Job
Intercept	-1.627 (-3.35) --	-1.438 (-2.851) --	-1.475 (-2.97) --	-1.143 (-2.29) --
Age	.144 (7.49) [-.551]	.245 (11.16) [.219]	.244 (11.70) [.239]	.268 (12.32) [.515]
Age Squared (10^{-2})	-.195 (-9.27) [.380]	-.373 (-14.19) [-.195]	-.335 (-14.09) [-.083]	-.398 (-15.36) [-.360]
Education	.111 (2.23) [.108]	.059 (1.19) [.081]	-.170 (-3.42) [-.056]	-.281 (-5.646) [-.144]
Value of Land (10^{-4})	.012 (1.15) [.003]	-.028 (-2.48) [-.023]	.058 (5.78) [.035]	-.007 (-.964) [-.013]
Value of Land Squared (10^{-9})	-.014 (-1.814) [-.000]	.026 (1.521) [.009]	-.046 (-5.83) [-.020]	.001 (.64) [.010]
Value of Assets (10^{-3})	.001 (3.28) [.028]	-.056 (-8.30) [-.082]	.011 (3.40) [.035]	.000 (.022) [.016]
Distance from Town	.023 (2.57) [.000]	-.018 (-2.07) [-.128]	.045 (5.04) [.079]	.039 (4.45) [.067]
Village Wage	.007 (.30) [.085]	.032 (1.34) [.137]	-.106 (-4.53) [-1.64]	-.065 (-2.80) [-.077]
Log Likelihood	-8067.79			
χ^2	2169.13			
ρ^2	.12			
LR	757.26			
Wald Test	556.57			

Figures in parentheses are asymptotic *t*-ratios.
Figures in square bracketsd are quasi-elasticities.
Nonparticipation is the residual choice.

Table 4b: Maximum Likelihood Polychotomous Logit Estimate of Model 3: Female

	One Job		Multiple Jobs	
	Self Employed	Wage Employed	Self Employed with Second Job	Wage Employed with Second Job
Intercept	-1.788 (-5.31) --	-.279 (-.66) --	-2.03 (-6.15) --	-.008 (-.022) --
Age	.122 (8.18) [.169]	.101 (4.95) [.005]	.191 (12.45) [.843]	.139 (7.64) [.211]
Age Squared (10^{-2})	-.175 (-9.66) [-.067]	-.196 (-7.28) [-.030]	-.283 (-14.53) [-.495]	-.250 (-10.36) (-.213)
Education	-.185 (-5.69) [.056]	-.667 (-14.56) [-.028]	-.463 (-14.13) [-.059]	-1.024 (-20.17) [-.184]
Value of Land (10^{-4})	.031 (3.06) [.002]	-.042 (-1.79) [-.009]	.086 (9.88) [.042]	.004 (.61) [-.009]
Value of Land Squared (10^{-9})	-.026 (-2.74) [-.002]	.004 (.59) [-.003]	-.067 (-6.99) [-.027]	-.000 (-.099) [.008]
Value of Assets (10^{-3})	.012 (4.49) [.020]	-.160 (-9.17) [-.057]	.017 (6.68) [.035]	.000 (.041) [.001]
Distance from Town	.016 (2.71) [-.027]	.023 (3.42) [-.001]	.050 (9.22) [.092]	.055 (9.36) [.064]
Village Wage	-.050 (-3.334) [.002]	-.016 (-.91) [.015]	-.099 (-7.13) [-.116]	-.104 (-6.68) [-.074]
Log Likelihood	-8111.01			
χ^2	2394.41			
ρ^2	.13			
LR	786.49			
Wald Test	530.31			

Figures in parentheses are asymptotic *t*-ratios.
Figures in square bracketsd are quasi-elasticities.
Nonparticipation is the residual choice.

Table 5: Maximum Likelihood Polychotomous Logit Estimate of Model 4: Male

	One Job	Multiple Jobs			
		Jobs in Different Sectors		Jobs in Same Sector	
	Only	Self Employed	Wage Employed	Self Employed	Wage Employed
Intercept	-.259 (-.56) --	-2.056 (-3.89) --	-1.18 (-2.25) --	-1.617 (-2.68) --	-1.941 (-3.21) --
Age	.157 (8.38) [-.534]	.234 (10.63) [.248]	.261 (11.31) [.475]	.223 (8.44) [.090]	.212 (7.74) [.059]
Age Squared (10^{-2})	-.233 (-11.24) [.308]	-.318 (-12.71) [-.106]	-.385 (-13.98) [-.304]	-.323 (-10.27) [-.052]	-.333 (-9.83) [-.062]
Education	.089 (1.89) [.190]	-.124 (-2.41) [-.025]	-.270 (-5.28) [-.099]	-.238 (-4.12) [-.033]	-.285 (-4.90) [-.041]
Value of Land (10^{-4})	-.014 (-1.96) [-.027]	.073 (7.40) [.030]	-.006 (-.81) [-.006]	.023 (1.19) [.004]	.002 (.12) [-.001]
Value of Land Squared (10^{-9})	.001 (.86) [.016]	-.059 (-6.47) [-.017]	.001 (.59) [.006]	-.046 (-1.02) [-.006]	-.006 (-.43) [.001]
Value of Assets (10^{-3})	.007 (1.82) [.003]	.013 (3.75) [.009]	.009 (2.40) [.005]	.007 (1.54) [.001]	-.024 (-2.67) [-.016]
Distance from Town	.001 (.07) [-.143]	.042 (4.52) [.045]	.037 (4.02) [.041]	.057 (5.52) [.037]	.057 (5.56) [.035]
Village Wage	.018 (.80) [.239]	-.094 (-3.84) [-.084]	-.099 (-4.08) [-.111]	-.142 (-5.12) [-.072]	-.016 (-.59) [.012]
Log Likelihood			-8321.07		
χ^2			1732.52		
ρ^2			.09		
LR			144.86		
Wald Test			112.76		

Figures in parentheses are asymptotic *t*-ratios.
Figures in square bracketsd are quasi-elasticities.
Nonparticipation is the residual choice.

Appendix Table 1: Maximum Likelihood Polychotomous Logit Estimate of Model 4: Female

	One Job	Multiple Jobs			
		Jobs in Different Sectors		Jobs in Same Sector	
	Only	Self Employed	Wage Employed	Self Employed	Wage Employed
Intercept	-.688 (-2.35) --	-2.518 (-7.15) --	-.618 (-1.44) --	-2.262 (-3.79) --	-.861 (-1.65) --
Age	.109 (8.27) [.139]	.198 (12.08) [.683]	.153 (7.13) [.176]	.162 (5.62) [.084]	.118 (4.64) [.037]
Age Squared (10^{-2})	-.174 (-10.73) [-.102]	-.290 (-13.89) [-.387]	-.271 (-9.31) [.155]	-.257 (-6.80) [-.057]	-.218 (-6.41) [-.047]
Education	-.335 (-11.52) [.007]	-.436 (-12.70) [-.047]	-1.027 (-16.87) [-.108]	-.642 (-9.32) [-.019]	-.994 (-12.63) [-.057]
Value of Land (10^{-4})	.007 (0.70) [-.015]	.100 (10.36) [.040]	-.002 (-.27) [-.006]	.037 (1.27) [.001]	.042 (2.57) [.002]
Value of Land Squared (10^{-9})	-.001 (-1.17) [.009]	-.008 (-6.87) [-.027]	.001 (.52) [.005]	-.007 (-.70) [-.004]	-.003 (-1.94) [-.001]
Value of Assets (10^{-3})	.005 (1.95) [.000]	.016 (6.42) [.016]	.005 (1.02) [-.000]	.006 (1.11) [.000]	-.002 (-.29) [-.003]
Distance from Town	.018 (3.56) [-.028]	.042 (7.45) [.050]	.053 (8.19) [.038]	.079 (8.50) [.030]	.059 (7.25) [.024]
Village Wage	-.030 (-2.32) [.048]	-.082 (-5.58) [-.063]	-.108 (-6.09) [-.051]	-.189 (-7.56) [-.049]	-.111 (-5.13) [-.030]
Log Likelihood			-8575.49		
χ^2			2092.15		
ρ^2			.11		

Figures in parentheses are asymptotic *t*-ratios.
Figures in square bracketsd are quasi-elasticities.
Nonparticipation is the residual choice.