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AN ANALYSIS OF WIFE'S LABOR FORCE PARTICIPATION IN THE PHILIPPINES AND THE THRESHOLD HYPOTHESIS

by

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A B S T R A C T

This paper analyzes and estimates the effects of income, education, unemployment level, fertility, location of residence and migration on the wife's probability of being employed. The study examines the research problem in relation to a neoclassical model of the "new home economics" variety as well as to the idea that among poor families wife's labor supply is governed primarily by the need to attain or maintain a subsistence standard of living.

Using logit analysis, the authors confirm earlier findings that below some threshold education the effect of additional schooling is negative, while above it the marginal effect is positive. It is also observed that below some critical level of family income (FY*) the coefficients of regional unemployment rate and duration of marriage are positive and the coefficient of urban location, net of the generally negative effect of migration status, is negative. In contrast, beyond FY*, the effects of these variables are insignificant except for urban location. An explanation suggested for these results is that in making labor supply decisions the constraint of keeping income from falling below subsistence is operative among households with husband's income less than FY* but not among those with higher incomes.

AN ANALYSIS OF WIFE'S LABOR FORCE PARTICIPATION IN THE PHILIPPINES AND THE THRESHOLD HYPOTHESIS[1/]

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Why is it that some wives are employed, while others are not? How do factors associated with development influence wife's participation in the labor force?

This paper is a study of labor force participation of married women in the Philippines. In particular, it analyzes and estimates the effects of income, education, unemployment level, fertility, location of residence and migration on the wife's probability of being employed.[2/] It is hoped that this study is of social interest in the light of current demands for a re-examination and change of women's roles and status as well as the expressed desire to promote greater female participation in the process of development.[3/]

1/ The authors are assistant professor and graduate student of the School of Economics, University of the Philippines, respectively. We wish to acknowledge CAMS' financial support for this research, which is part of a larger comparative study of the labor force participation behavior of married women in selected ASEAN countries. We are indebted to Ms. Felice Llamas for computer programming.

2/ The term "employed" includes persons who are working for pay or profit, or without pay on the farm or business enterprise operated by a member of the same household related by blood, marriage or adoption. This is the National Census and Statistics Office definition of a person at work.

3/ The concern for women's roles and status is discussed in Tinker and Bramsen (1976) and the World Population Plan of Action. Recently,

The present study examines the problem largely from the standpoint of the household labor supply decision. It considers the issue in relation to a neoclassical model, which views time allocation behavior of wives as a result of a decision process in which the household maximizes utility, as well as to the idea that among poor families wife's labor supply is governed primarily by the need to attain or maintain a subsistence standard of living.

The next section of this paper briefly reviews the economic theory of labor supply and discusses several hypotheses regarding the influence of the variables under consideration. Section 2 presents logit equations estimated from the 1973 National Demographic Survey data to test these hypotheses. Finally, some implications are drawn in the last section on the basis of which we speculate on the probable relationship between development and female labor force participation rate.

The Hypotheses

Before the sixties, economists generally analyzed labor supply behavior in terms of an individual attempting to allocate his available time between leisure and market work in a way that would maximize his

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the World Bank has emphasized the view that "if progress is to be made in reducing poverty, if the needs of the poor are to be adequately addressed and met, development programs must be designed to reach women as well as men . . . thus, to ensure that so large proportion of the world's human resources is not underutilized" (p. 11).

utility.[4] From this model, it was deduced that the effect of an increase in wage rate depends on the relative strengths of the income and substitution effects. Subsequent empirical studies based on cross-section data found negative correlations between wage rate and labor supply, suggesting the predominance of the income effect. This finding gave rise to the so-called backward bending labor supply curve hypothesis.[5]

The implication of this hypothesis is that economic growth would be accompanied by rising demand for leisure and declining labor supply. While for the male population this proposition is generally in accord with facts, it appeared inconsistent with the observation that over time labor participation rate of women in the U.S. as well as other developed countries has been rising. The emergence of the working wife then became a paradox.

In an attempt to explain this paradox, Mincer (1963) argued in his seminal paper that the labor-leisure choice framework, on which past studies of labor supply were based, was inadequate for analyzing labor force participation behavior of females especially married women. The reason for this is that the model ignored an important dimension in a

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[4] See Robbins (1930).

[5] The backward bending supply of labor hypothesis is discussed in Bowen and Finegan (1969) and is usually found in labor economics textbooks (e.g., Fleisher 1970; Rees 1973).

woman's time allocation decisions, namely, household production. An increase in the female wage rate raises the opportunity cost not only of leisure but also of household work, thereby inducing her to substitute market goods for home production. For this reason, one would expect the price effect of an increase in own wage rate to be larger among married women than men. Statistical studies by Mincer indicate that indeed, unlike men, wives with higher potential earnings tend to participate more in the labor market.[6/] As expected, the influence of husband's wage on wife's labor supply, which represents a pure income effect, is negative. But the substitution effect is so large that wife's labor supply would still tend to increase even if both male and female wage rates were raised by the same proportion. The explanation, therefore, for the rising participation of women in the labor market in spite of rising family income and demand for leisure is that wives tend to reduce their household production in the face of rising wages.

In more recent years, Becker's (1965) time allocation theory has been widely applied to the study of fertility, child care, and wife's labor market behavior. These studies, one of which will be subsequently discussed, attempt to provide more insights into the household labor supply, production and consumption decisions. Essentially, however, they reinforce Mincer's hypothesis in regard wife's labor participation

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6/ Cain (1966) and Bowen and Finegan (1969) reported similar findings.

behavior.[7/]

The idea that rising wage rates tend to draw married women into the labor market as well as the view that households are optimizing agents in the usual neoclassical sense may need some modification, when applied in LDCs. In a thought provoking study, Encarnacion (1975) suggested that, below some threshold income, households may simply be aiming at maintaining some subsistence standard of living. Consequently, he hypothesized that

> "at income levels below the threshold, more hours of work would be supplied on the market by a married woman if her earning power (proxied by her education level) is lower, on the grounds that the family as the decision-making unit would attempt to reach the subsistence level of income. At income level above the threshold, the marginal effect of the wife's earning capacity on labor force participation is positive because of a more dominant substitution effect" (p. 191).

Regression estimates of the effect of education on wife's labor force participation confirm Encarnacion's conjecture. The marginal effect of education below elementary grade is negative; above it, the impact is positive. As expected also, wives with husband's income below ₱1,500 (more or less the earnings of a minimum wage earner in 1968 when the survey data were obtained) tend to participate less when their education is higher. In contrast, education is positively correlated with

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7/ For examples of applications of Becker's time allocation model, see T.W. Schultz (1974). For evidence of a positive wage effect on wife's labor supply in developing countries, see McCabe and Rosenzweig (1976) and Da Vanzo (1972).

wife's labor force participation among households where husband's income is greater than ₱1,500. Other empirical studies report similar findings.[8/] All of these studies, however, appear to have a methodological weakness. Their dependent variable is binary and, hence, it may be argued, their use of ordinary least squares method for conducting tests of significance is, strictly speaking, inappropriate for reasons discussed in Nerlove and Press (1973) and Theil (1971).[9/]

To gain additional insights, a further analysis of the labor force behavior of married women is made in this section. To this effect, we present an influential neoclassical time allocation model of the "new home economics" variety and examine it in the light of Encarnacion's (1975) findings. Several implications regarding the effects of unemployment level, fertility, location of residence and migration are derived from this model. In the process, we advance alternative conjectures based on the hypothesis that, among households with subsistence income or less the labor force participation behavior of the wife is primarily deter-

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8/ Mangahas and Jayme-Ho (1976) and Encarnacion and Canlas (1977).

9/ Using a sample of 250 married or formerly married women aged 35-39 from the 1968 National Demographic Survey of the Philippines, Nerlove and Press (1973) found that education has a significantly positive effect on labor force participation. They did not, however, test for the existence of a threshold education. Their point, however, is that, comparing their results obtained by logit analysis vis-a-vis OLS, they found significant differences not only in the estimated elasticities but also in the conclusions that one might likely infer about the significance of the coefficients of some of the independent variables.

mined by the need to attain or maintain the household's subsistence standard of living. For convenience, we refer to it as the "subsistence hypothesis."

Consider Figure 1, which is a graphical presentation of Gronau's (1974) model. Assume that the value of the marginal product of wife's time devoted to nonmarket activites (Tn) declines as Tn increases due to the law of diminishing marginal returns. This relationship is illustrated by the curve D_1 and is referred to as the derived demand function for housewife's time. The supply of housewife's time is perfectly inelastic at Tn*. [In the absence of market opportunities, the price of housewife's time is determined by the intersection of Tn* and D_1.) This price P* defines her entry or reservation wage. [The market wage rate (W) must be higher than P* to make her participate in the labor market; otherwise, she would not.] Ceteris paribus, then, the higher the market wage relative to the entry wage, the greater the probability of her participating in the labor market.] Hence, it can be argued that since education is positively related to earning potential, it would also be positively correlated with labor force participation, other things being equal. But this need not be so.

[Wife's education may increase the productivity of her nonmarket time.) For example, with better education she is perhaps able to bear more children and provide better health and learning conditions at home.

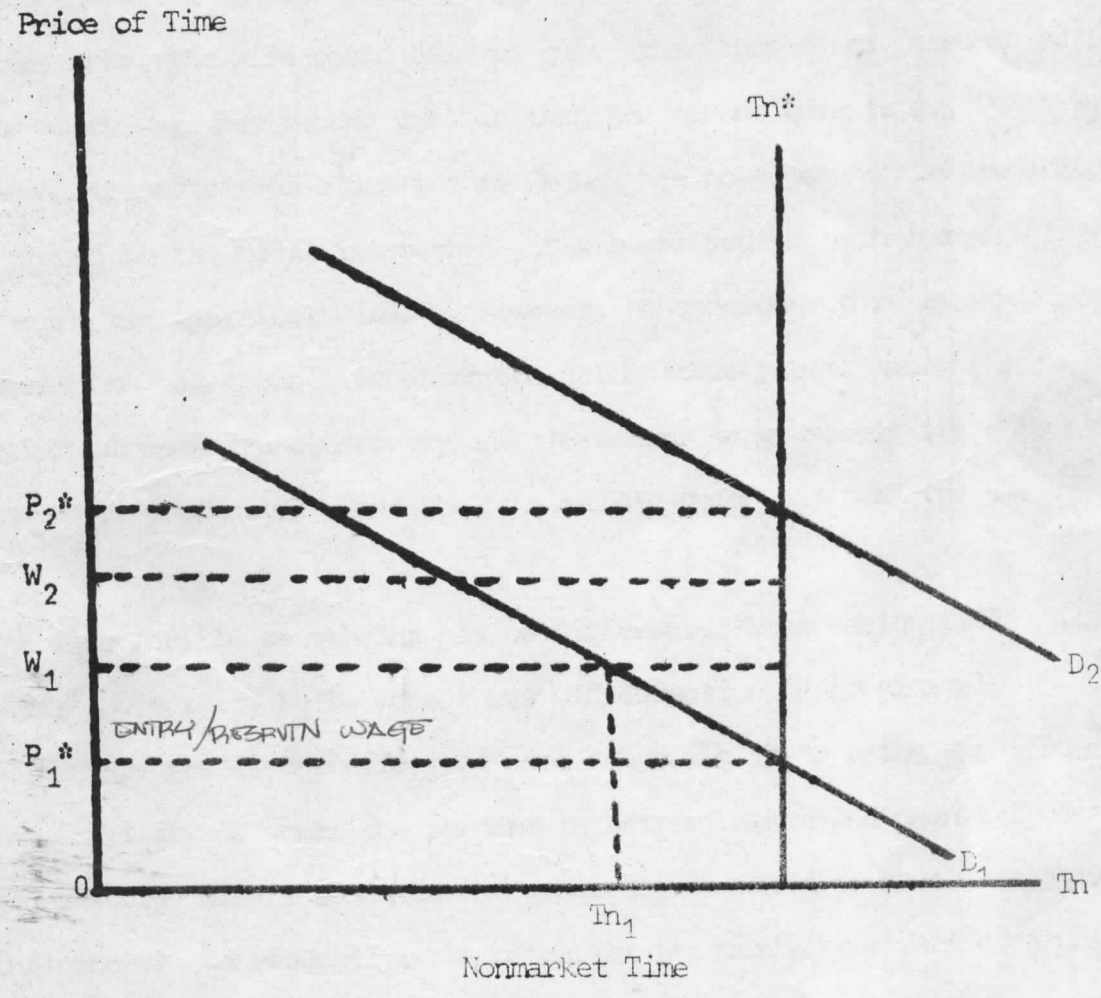
Price of Time
Tn*
P_2*
W_2
W_1
ENTRY/RESRVTN WAGE
P_1*
D_2
D_1
0
Tn
Tn_1
Nonmarket Time

Figure 1

Consequently, her productivity at home is also increased. [This would have the effect of shifting D_1 to D_2 and increasing the entry wage from P_1^* to P_2^*.] If the increase in the market wage associated with more education is less than the increase in the demand for her nonmarket time, then, the wife would tend to quit the labor force inasmuch as her entry wage may become greater than her market wage [(e.g., $P_2^* > W_2$). Hence, the effect of education as Gronau has noted cannot be predicted a priori by the model inasmuch as it also raises her entry wage. Interpreting his empirical results, however, he concludes that "[as expected, education has a positive effect on labor force participation; its effect on market productivity and the asking wage exceeds its effect on nonmarket productivity and the housewife's price of time" (p. 473).

[The case for LDC households may be different. Encarnacion (1975) has pointed out that, below some threshold education (approximately, elementary grade), the effect of more schooling is to raise significantly the fertility of women due perhaps to better health and prenatal care.] (In the U.S. wife's education is generally believed to have a negative influence.) Consequently, the nonmarket productivity effect of education below elementary grade might tend to be much larger. The negative correlation between labor force participation and education below elementary grade may, therefore, be interpreted to mean that the effect of education on the value of her nonmarket time exceeds its effect on her market wage. At much higher levels of education, however, the probability of being in the labor force may increase with more education.

The reason is that, while its effect on earning potential continues to be positive and, perhaps increasingly large, its marginal effect on fertility has also been observed to become negative above elementary grade, suggesting that, above some threshold level, education might no longer have a substantial positive effect on her entry wage.

The analysis above clearly shows that Gronau's model is consistent with the finding that the effect of education on wife's market work is negative below elementary grade and positive above it. The question, therefore, is, to what extent can this model be made to bear on the problem of wives' labor force participation in an LDC like the Philippines? How useful is the subsistence hypothesis in analyzing the employment status of married women in developing countries?

In Gronau's model, the effect of fertility, as earlier hinted at, is to raise wife's entry wage and, hence, lower her probability of working in the market. One way of testing this hypothesis is to include duration of marriage in a labor supply regression equation. This variable is a predetermined factor that is highly correlated with fertility. (The direct inclusion of number of births as an explanatory variable would be inappropriate in that, in this model, labor supply and fertility are simultaneously determined.)[10/] The expectation that duration of

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10/ This point has been raised by a number of authors (e.g., Hall 1974; McCabe and Rosenzweig 1976). Although Gronau is aware of this issue, he, nonetheless, treats children in his empirical study as an independent variable on the ground that "taste for child services" and

marriage is negatively correlated with wife's employment is reinforced by other considerations. [Aside from the fact that, an earlier age at marriage (hence, longer duration of marriage) allows her to produce more children, it might also indicate a greater preference for home commodities like "child services."] Conversely, earlier marriages may be highly correlated with lower labor market commitment, less market-oriented human capital and, hence, lower potential wage.[11/] Furthermore, as Gronau has noted, "years married" may be used as a proxy variable for "home experience" to capture the effect of on-the-job training on the wife's value of time. [Duration of marriage, however, is likely to be positively correlated with the number of young children.] If the inhibiting effect of fertility is largely due to the presence of young children, who are likely to be mother's-time-intensive, and not to the number of older children, then, we can expect that more recently married women, ceteris paribus, are likely to put a high value on their nonmarket time. Hence, duration of marriage has effects on wife's labor supply that work in opposite directions. The net effect, of course, will depend on the relative strengths of these conflicting forces.

[The subsistence hypothesis suggests that the correlation between length of marriage and wife's employment is positive for families with subsis-

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"household production functions" differ and, hence, consumption of "child services" may vary among couples with seemingly identical characteristics like education, age and income.

11/ An excellent discussion of the effect of marriage and fertility on job continuity, human capital accumulation and market wage can be found in Mincer and Polacheck (1974).

tence income on the ground that additional children associated with longer marriage raises the subsistence needs of the family, and, hence, pressures the wife to do more market work to increase family income. Furthermore, to the extent that, as discussed above, early marriages may be associated with lower accumulation of human capital, the wife will have to work more because of a probably lower earning capacity. Her tendency to work more is, moreover, facilitated by the fact that her children are older. Hence, on the basis of the subsistence hypothesis, the effect of duration of marriage is definitely expected to be positive among wives whose husband's income is less than subsistence level.

To have a good estimate of the effect of duration of marriage, we must control for wife's age due to the correlation between the two variables and the fact that age is said to have effects independent of length of marriage on wife's market and nonmarket productivities. For example, potential market wage tends to rise with age, at least among women with formal education. On the other hand, the wife's entry wage might be affected by age due to the so called "cohort effect" and "life cycle consumption effect."[12/] Obviously, it is not possible to predict a priori the effect of age on wife's labor force participation.

12/ See Ghez and Becker (1972) for an analysis of life-cycle consumption effects. For Gronau, the "cohort effect" means that older cohorts have a greater demand for home commodities relative to market commodities.

In discussions of labor supply behavior the level of unemployment is considered to be an important factor. There are two well-known hypotheses in this regard, the "additional worker" and the "discouraged worker" effects. In the additional worker hypothesis, it is argued that, when unemployment rate rises, other members of the family are likely to get un- or under-employed. Consequently, the wife may be pressured to work in the labor market to maintain its living standard. On the other hand, according to the "discouraged worker" hypothesis, a higher unemployment rate makes it more difficult and costly for wives to find a job. Hence, she may stop looking for work actively. Obviously, the net impact of rising unemployment rate depends on the relative strengths of these two opposing forces, which would generally depend on the family's financial condition and psychological predisposition. In this regard, we conjecture that among households where husband's income is below subsistence level, the "additional worker effect" is likely to be dominant because they strongly want to maintain a subsistence level of income and they are likely to perceive or experience a relatively lower actual or expected family income as would be explained below. On the other hand, among families with incomes above subsistehce, the "discouraged worker effect" will be stronger. In the context of Gronau's model, the effect of a high unemployment rate is to decrease the present value of wife's expected potential earnings as search cost is high. Therefore, it reduces her desire to look for work. At the same time, however, her entry wage may fall as a result of a possible decline in the value of her marginal product at home. There are several reasons

for this decline aside from the possibility of a reduction in husband's current income.[13/] For one thing, the family's perception of the husband's expected long-run income may be lower when unemployment rate is high. In addition, in LDCs a significant amount of family income and household work is done by family members other than the couple, e.g., relatives and older children. When unemployment rate is high, some of them may be disemployed or underemployed; other members who are not yet gainfully employed but are expected to contribute to family income may find it more difficult to get a job. All these would tend to reduce either current or expected long-run family income and increase manpower available for household work. Consequently, given the negative income effect and the additional manpower available at home, demand for housewife's time and, hence, her entry wage is reduced. Obviously, the net effect of a rising rate of unemployment would depend on the relative strengths of two conflicting forces and it is a matter for empirical investigation.

In this regard, there appears to be a consensus that the effect of a higher unemployment rate, apparently even in LDCs, is negative, which

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13/ The income effect on the demand for housewife's time is said to be positive. Willis (1974) and Gronau (1973) have shown, for example, that an increase in the initial endowment of non-human capital increases the demand for "child services" and a composite of other commodities (assuming linearly homogeneous household production functions and ruling out inferior commodities) and raises the demand for all inputs. Hence, it also raises demand for housewife's time and her entry wage. An increase in husband's income has a similar effect. In addition, however, it is reinforced by the possible substitution of market goods and wife's time for husband's time.