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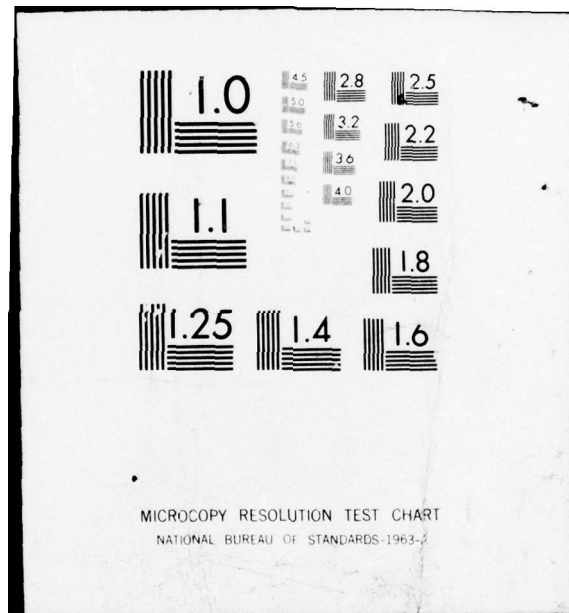
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William P. Butz

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NOTES ON USING HUMAN CAPITAL AND HOUSEHOLD * PRODUCTION MODELS IN LESS-DEVELOPED COUNTRIES

by

William P. Butz

The application to less-developed countries (LDC's) of human capital and household production models that were formulated for analysis of developed economies holds much promise. But the transfer will not be easy. Apart from the well-known problems of transforming concepts of income, labor force, and saving into operational constructs in LDC settings, a variety of other differences will surely emerge as human capital economists increasingly study the determinants and consequences of investments in children, health, nutrition, schooling, training, and migration in LDC's. In this note, ^{are briefly explored} ~~I briefly explore~~ the consequences^{earlier} for surveying and research of three such differences that have emerged prominently in ~~my own~~ research. These differences are related only in that each concerns a facet of family behavior that differs significantly and systematically between most developed and most underdeveloped countries, and in that each difference must often be accounted for to avoid bias or irrelevance in studying LDC family behavior with the usual kit of human capital or household production models. **

Are Optimizing Models of Family Behavior Appropriate for LDC's?

It is still sometimes asserted that optimizing models of family behavior are not useful in peasant societies because people there, especially in subsistence agriculture, live outside the market economy. Since most everything is produced and consumed at home, the argument goes, relative scarcity signals carry inaccurate information and are only poorly transmitted among households. Hence, even if individual families behave as though maximizing utility, the

* Presented at the Agricultural Development Council Workshop on Household Studies, Singapore, August 3-7, 1976, and at the International Union for the Scientific Study of Population Seminar on Application of Economic Models of Household Decision-Making to Less-Developed Countries, Mexico City, November 4-6, 1976.

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** I restrict the many generalizations in this paper to Latin America and Southeast Asia and won't argue with anyone who begins citing exceptions, so long as there aren't many.

constraints on this behavior are not related to factors in the larger community in the way economic models postulate, if at all. Accurate predictions about individual and family responses to changes in prices, wages, and the supply of information and other goods will, therefore, not emerge.

Though the usefulness of this assertion is best investigated in the results of analyses using optimizing household models, its critical assumption seems to me to be false in most less developed cultures. In fact, LDC families often seem linked to product and factor markets through much richer networks than families in modern societies. For one thing, families in many LDC cultures engage regularly in the household production or sale of fairly standardized goods and services that trade for a price in local markets, whether or not a particular family actually sells any of its own product. Second, these family products are frequently produced using purchased, rented, or owned factors--e.g., labor, land, hemp, ground corn--that trade in active local markets. Third, a much greater proportion of children, youth and even adult women hold at least one labor market job during the year in many LDC cities and villages than in developed countries. Even in cases where the proportion of family income arising from such employment is small, the linkages to labor markets are still present.

There is good reason to expect these product and labor markets to accurately reflect relative scarcities within the locale. The hourly, daily, and seasonal variation in product prices in local peasant and urban markets has been documented in at least a few cases. On the labor market side, the observed variety of odd jobs with flexible work hours available seasonally to children and adults appears to provide opportunity for choices among leisure, home work, and market work at margins (of hours per week and weeks per year) at least as fine as in modern labor markets.

Hence, many local markets in LDC's appear to share the characteristics of price sensitivity to supply and demand variations, rapid information flow, and widespread participation (on the labor, other factor, and product sides) by family members. The successful application of

optimizing models to the study of family responses concerning migration, agricultural acreage, technology adoption and fertility should be extendable to other areas.

There are differences, however, that should be taken into account.

The Link Between the Market Wage and the Opportunity Cost of Time

Household production models usually assume that the wage entering the budget constraint is a good proxy for the marginal price of time in marriage, child care, transportation, or whatever. In data from developed countries, the predictions dependent on this assumption are consistent with much evidence, and there are independent reasons for supposing the assumption to be near enough to truth for persons who spend some time in the labor market. There, time in most market jobs is not easily used in cooking, visiting a doctor, or breast-feeding a child, for example.

In less-developed rural areas, however, there are emerging indications that the evidence may not support similar predictions, at least concerning fertility and breast feeding behavior. In these cases, zero and positive partial associations are emerging between women's wage, schooling, and earnings, on the one hand, and output of productive nonmarket activities that take time, on the other. This evidence is consistent with the supposition that hourly earnings is not a good proxy for time price, and that positive income effects are emerging. The likely reason is that widely prevalent kinds of work in LDC's can apparently be done without significant interference with child care, other household duties, or even transportation. Weaving baskets, tending store, and shelling beans are examples. Another reason may be the more common availability in LDC's of substitutes for one's own time in household production. Older children and other relatives nearby are probably inexpensive and flexible stand-ins for mothers in child care and for fathers in upkeep of the house. Perhaps more importantly, parents may consider these persons to be closer substitutes for themselves than are purchased goods and services in modern settings.

Hence, either joint production possibilities or elastic supply of home production input substitutes weaken the link between earnings and the price of time in non-labor-market activities. In this situation, examining the quantity of labor demanded in the community or region in conjunction with persons' characteristics affecting their supply of labor is not sufficient. It is also important to examine the structure of labor market demand in terms of jobs with characteristics (distance, type of work, ease of adjusting hours) that are more or less compatible with childrearing or the other non-market activity of interest.

In the United States, an important research problem the last five years has been how to estimate the value of time of women who do not participate in the labor market and have a wage rate. From initial concentration on methods of imputing a market wage, research has moved to methods of estimating the magnitude of difference between such an imputed market wage and the actual shadow wage. A difference arises because of fixed costs of labor market entry or household exit, and because of the assumed downward slope of the marginal product curve in home production.

In less developed countries, the problems are different. First, I would bet for reasons discussed above that a much larger proportion of women (and children) in most areas of Latin America and Southeast Asia have ever worked for earnings than in Europe and North America: wages for fewer women must be imputed if one has good retrospective or panel data. Second, the possibilities for estimating shadow wages for women who have not reported market earnings are considerably more varied than with data from developed countries. If there is household production of a product whose amount can be measured, the woman's marginal value product may be estimated either through production function estimation (when the product has a price) or through inference from equality of marginal product-factor price ratios when some of the prices of other factors are observed.

In addition to these possibilities, there are competing hypotheses about the causal nature of the link between market work and home production in LDCs: if women who earn an above-average wage in the labor market

tend to have fewer children, it may be because the *quantity* of children *demand*ed is less at the higher time price the market wage offer has produced. On the other hand, women who work at these high-wage jobs may also be spending more time in "modernizing" institutions where their *demand* curve for children shifts down as they learn about other uses of their time and associate with more modern women who participate in them. Whether it is increase in opportunity cost of time spent at home or exposure to "modernizing" institutions that shifts patterns of home production and investment in human capital when persons take relatively high-wage jobs, has important implications. Increasing the effective demand for labor in jobs not compatible with home production tends to raise the average cost of production at home and lower the amount produced in one case. In the other, this result occurs only or mainly if the jobs are of particular types, and the same outcome is expected, for example, from the operation of social clubs that bring traditional people into frequent contact with more modern ones.

Analysis of this question is hampered by the fact that the characteristics of available jobs in a community are not in general independent of women's and families' characteristics that independently affect fertility, breast feeding, and other behaviors.

The Importance of Children's Economic Value

In studying family behavior with respect to marriage, fertility, schooling, saving, nutrition and health, and in describing or analyzing the personal distribution of income, it is risky to ignore the economic contribution of children to LDC households.

In the U.S., it has not been costly to assume that young children's opportunity cost of schooling is zero and that cross-sectional variations in the economic value of children or the supply of substitutes for this value are not significant enough to influence couples' fertility or child nutrition, health and schooling decisions. In less developed countries, however, substantial variation in these factors can exist, and parents, where surveyed, are aware of the differences. It should prove useful to consider children's time a factor in household production functions

and to enter in the family's budget constraint income from children's market work, production of home outputs, and later contributions to aged parents. The effects of changes in community prices of home-produced output, in supply of inputs that substitute for or complement children in home production, and in supply of substitutes for the social security or insurance payoffs from surviving children can be studied by estimating the implied home production functions and factor demand functions.

The Importance of Variations in Breast Feeding

In societies where modern contraceptives and nutritious hygienic weaning foods are expensive in terms of money or effort, length of lactation may be a critical factor influencing population growth rates and the survival and physical and mental development of children. Lactation is less important in developed countries for three reasons. First, there is much less variation across women, with most hardly breast feeding at all in many places. Second, lactation is not often an effective constraint on either birth spacing or child development anyway, since good weaning foods and more reliable spacing methods are often inexpensively available. Third, further improvements in nutritional intake do not improve the health and development of normal children who are already adequately nourished: in otherwise well-nourished and medically-protected populations, breast feeding has little to contribute to development or disease immunity of children.

Because of these differences, researchers interested in birth spacing, demand for contraceptives, and the determinants of children's health and nutrition in less-developed countries should consider taking length of breast feeding explicitly into account. Further, variations across women in the biomedical and behavioral determinants of breast feeding may indirectly influence their labor market participation and responsiveness to changes in labor market conditions.

Some Implications for Household Surveys in Less-Developed Countries

The same characteristics of traditional LDC labor markets that produce their fluidity and widespread participation also make studying them very difficult. Among these characteristics are an abundance of short-term jobs, often seasonally available; low worker turnover costs to employers; wages frequently paid in goods and services; timing and amount of payment subject to continual renegotiation; and prevalence of spoken agreements without written records. A common result is very frequent job and employee turnover, especially in urban areas where persons can hold successive odd jobs of less than a day's duration. Children's labor market participation has the same characteristics even in villages, in areas I have observed.

Documenting hours worked, earnings, distance of work from home, job training, occupation, and other job characteristics to which human capital and household production models direct attention is difficult. Obtaining reliable information on past earnings, time worked, and training is even harder. To complicate matters more, researchers interested in the opportunity cost of persons' time at home will in many cases want to know considerably more about a market job than earnings and hours, for reasons discussed above. Although there are general principles to guide labor market surveying under these conditions, many decisions must be made in light of local characteristics, since the decisions depend on the length of reference period that can be reliably surveyed retrospectively, the type and extent of daily and seasonal variation in employment and earnings, the ways in which workers are paid, and the relative reliability of alternative respondents in giving particular information.

Although economists are less accustomed to dealing with survey data on household work than on labor market work, and much less such data exist, they may often be easier to obtain reliably. Through one or another method of time budget surveying, it is generally possible to document the amount of time that particular household members spend in specific activities during a recent short period. The problems come

when the surveyor tries to push the respondent's memory over too long a period, when the surveyor tries to discover everything a person did during a time interval with hopes of later aggregating up to categories of interest, or when the particular activity categories to which the researcher's model directs attention do not correspond to how the respondent thinks about dividing up his or her day. It does take some continuing interplay between user and gatherer of the data to avoid these difficulties--more in time budget surveying in its current state than in surveying income, wealth, labor market work and demographic characteristics.

Research interest in children's economic contribution to parents and with breast feeding as an important input into child development and birth aversion leads to additional survey concerns. Data on market work and on inputs and outputs associated with household production can be systematically utilized to estimate children's marginal and total economic contributions to their household.* Adult children's contributions of money, goods, and time to their aged parents can also be surveyed in alternative ways--for example, by asking how the respondent's family has treated his or her parents and parents-in-law, by asking the respondent how his children's families have treated him and his spouse, and by asking what the respondent expects to receive from his young children's future families.**

For breast feeding, researchers might want to document mothers' nutritional status, the time cost factors discussed above, the prices and availabilities of substitutes for breast feeding in promoting child development and averting births, the determinants of desired family size and birth spacing, and the determinants of the returns to investment in the health and development of a child. As a minimum, the length of total and partial breast feeding of children should be documented.

* A number of conceptually equivalent operational measures of child economic value in the household can be constructed, depending on the availability and reliability of different kinds of data in different situations. See William P. Butz and David H. Greenberg, *An Economic Methodology for Measuring the Benefits from Children*, The Rand Corporation, R-1792-RF, October 1975.

** In household surveys in Guatemala and Malaysia, we have found respondents capable of reliably offering considerable detail by type of help and individual children.

Summary

I have argued here that human capital and household production models will contribute much to understanding family behavior in less-developed countries. I have also suggested several new variables to be integrated into these models for use in these settings. In addition, I have warned that the familiar variables already there can often not be proxied in ways we are accustomed to. While the conceptual models may look similar, the descriptions of how empirical counterparts for theoretical variables are constructed will be different. In spite of these differences, I am convinced in this case, as in many others, that construction of separate and different models to explain people's behavior in less-developed countries would be less productive than intelligent adaptation of the optimizing models that have already proven useful in developed areas.