DISCUSSION

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In addition to their common use of data from the Consumer Anticipation Survey, the papers by Landsberger and Michael share a common theoretical framework based on Gary Becker's theory of the allocation of time and the theoretical characterization of the household which stems from it. Becker's theory enables them to incorporate into economic models of the household forms of behavior such as the number, spacing and quality of children and the division of labor within the household between the spouses which are often considered to be more within the realm of sociology than economics. More generally, Becker's model provides a way by which economists may attempt to formulate a unified explanation of a large number of variables, such as those encountered in the CAS survey, which describes the household and its behavior. If such attempts are to be fruitful, certain variables must be measured and certain theoretical difficulties must be met. I think that the Becker model or some modification of it will increasingly be the framework within which economists organize their inquiries into household behavior and I think the two papers before us represent interesting, but flawed examples of how to use the model. Accordingly, I shall first briefly describe the theoretical structure of the Becker model to set the stage for evaluating the use made of it by Landsberger and Michael.

According to Becker, households do not obtain direct satisfaction or utility from goods and services purchased in the market. Rather, to obtain satisfaction a household must combine the purchased good -- say, soap -- with the time of one or more household members as inputs into a household production function whose output -- say, cleanliness -- is the quantity that directly affects utility. In effect, then, the household is both the demander and supplier of its final wants and its demands for produced goods and services, conventionally treated as final, are in this model derived demands analogous to the derived demands for labor or capital in standard production theory.

Becker likened the household to a small factory using inputs to produce outputs. A more apt analogy, I think, is to liken the household to a small socialistic economy in which the "planner's preference" is maximized by allocating resources physically according to "commands." The planner represented by the household decision maker(s) -- perhaps the husband and wife acting in concert -- must allocate many factors of production -- member's time and individual types of purchased goods -- between many alternative uses, e.g., current cleanliness, warmth and child services, future productivity via education and future purchasing power via saving. The characteristics of this model are formally identical to those of a dynamic Walrasian general equilibrium system in which the planner's utility function and the household production functions generate market clearing, utility maximizing shadow prices for n factors of production and m final consumer goods where n and m are large numbers and where production and consumption may occur at different dates. Economists have learned that in its full glory, the Walrasian system is intractable for practical problems. Thus the essence of applying the Becker or the Walrasian model is to choose the appropriate level of simplification or complication. It is at this stage that both papers before us are flawed.

The paper by Landsberger presents a model of the labor supply of husbands and wives and the amount of family consumption as functions of their wage rates and the number and ages of their children which is derived from a time allocation model of the type just described. Since the main focus of this paper is on the "children effects," it is rather surprising to find that children occur nowhere in Landsberger's mathematical model. Instead, the effect of children on labor supply and consumption is introduced from outside the model by means of shifts in the marginal product schedules of goods and the time of each spouse devoted to household production that the presence of children of certain ages are supposed to cause.

The reasons given for these shifts seem to be inconsistent with the aggregation of all household outputs into one aggregate commodity X and this inconsistency, in turn, may be the reason that the effects of children were introduced in an ad hoc fashion from outside the model. The children effects seem to derive mostly from the hypothesis, parts of which are stated in various parts of the paper, that young children are relatively time intensive users of the wife's time and that, as they age, children become progressively less time intensive. Added to this is the more tentative hypothesis that the husband's time is used more intensively in non-child oriented activities.

One of the main implications of Becker's model is that the "shadow prices" of household outputs of commodities which are relatively time intensive will tend to increase as the price of time measured by market wage rates rises. Thus, households whose wage rates differ will also face different shadow prices for commodities. The Hicksian composite commodity theorem which justifies the aggregation of all purchased market goods into Y, on the assumption that all households face same set of market prices cannot, therefore, be used to justify the aggregation of all commodities into X unless all commodities are assumed to have identical factor intensities which, of course, contradicts the hypothesis that leads us to expect children effects.

These difficulties could easily be overcome if Landsberger would specify a two sector model in which household outputs are aggregated into two commodities, child services and other activities, the former being assumed intensive in the wife's time relative to the latter but growing more like the latter as the children age. One implication of this two sector model is that the relative shadow price of child services will increase as the wife's market wage increases, but that the sensitivity of the price of child services to the wife's wage diminishes as they age and become less time intensive. Landsberger assumes fertility to be exogenous so that this particular implication is without behavioral significance in his model. However, it is also implied by the two sector model that a shift in the composition of household consumption toward (wife's) time intensive commodities would tend to raise the marginal product of the wife's time at home causing her to withdraw labor from the market until the marginal product of her time at home and in the market are equal. This effect will diminish as children age and may even disappear or reverse itself if children become equally or less time intensive than other household activities. Landsberger's empirical results support these implications and, therefore, support the intuition which lead him to the time intensity hypothesis but they contradict his formal model.

Michael's model of household fertility, child spacing and child quality, on the other hand, seems to me to be insufficiently aggregated or at least insufficiently specified to sustain the considerable explanatory burden he places upon it. Using the same triad of inputs as the Landsberger model (husband's time, wife's time and market goods), the household produces a large set of commodities whose quantities enter into household utility. Of these commodities, Michael focuses mainly on the household's consumption of the commodity child services which, unsurprisingly, requires inputs of actual children in addition to time and goods inputs. Household fertility behavior, therefore, will depend on the demand for the quantity of children considered as a factor of production which is derived from the final demand for the commodity child services. The demand for child quality which, for empirical purposes, is identified with the level of schooling the child is expected to complete, is also derived from the demand for child services.

The implications of Michael's model for fertility and child quality, therefore, depend on the properties of derived demand functions in the case in which there are four factors of production. A strong argument can be made for the proposition that such derived demand functions have no empirically refutable implications unless the structure of the model (i.e. the utility function and household production function) is severely restricted. Diewert[1/] has shown, for example, that the elasticity of a derived demand function in the three factor case depends on eight parameters which include the partial elasticities of substitution between factors, the supply elasticities of each factor, factor shares in total cost and the elasticity of demand for the final product. The four factor case involves still more parameters. Michael's assumption that child services are relatively intensive in the wife's time will suffice to establish that the shadow price of child services will be an increasing function of the wife's wage if the wife works, but far more must be assumed before we know what this implies for fertility or child quality. Until we do know these implications, it is difficult to know what to make of his empirical work in either a hypothesis testing or descriptive framework.

While the emphasis in my discussion has been to stress the theoretical difficulties that may be encountered in applying the Becker model, I think these papers also illustrate the exciting prospect that economics may provide a really unified account of many seemingly unconnected aspects of household behavior.

FOOTNOTES

1/ W. E. Diewert, "A Note on the Elasticity of Derived Demand in the N-Factor Case," Economica (New Series) May, 1971, pp. 192-7.