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THE FAMILY[†]

What Have We Learned from the Economics of the Family?

By ROBERT J. WILLIS*

The family is distinguished from other social institutions, such as firms, by its crucial role in the production and nurture of children and its rationale is ultimately to be found in the preferences of individuals for own children. Sexual reproduction means that the production of one's own child requires the participation of another person of the opposite sex. The production of a child who will survive, become a successful adult, and produce his or her own children requires the expenditure of both personal and purchased resources over a lengthy period of time.

Although interesting insights on the family can be culled from the classics, systematic development of the economics of the family is a recent phenomenon, beginning in the late 1950's when Harvey Leibenstein (1957) and Gary Becker (1960) attempted to address the determinants of fertility behavior within the framework of consumer theory. In this paper, I provide a brief overview of the history of family economics since 1960 and, along the way, offer a selective assessment of what has been learned from it.

I attempt this assessment by asking how far we have progressed in answering a few of the larger theoretical, empirical, and policy questions that have motivated economists' interests in an area customarily studied by sociologists and demographers, or that have caused economists dealing with more traditional subject matter to incorporate the family into their work. Among the set of

questions that have been addressed within the literature during the past twenty-five years are:

1) What are the causes of the historical association between economic growth and development and demographic transition from high to low levels of fertility and mortality? Of what relevance is the historical experience of currently developed countries to contemporary LDCs? Should fertility reduction be a primary goal of policy in the developing countries? Are the developed countries in danger of extinction because of fertility below replacement levels?

2) What was the cause of the post-World War II "baby boom" and subsequent "baby bust"? Was the baby boom a one-time aberration from a secular decline in fertility, or can we expect substantial fluctuations in the birth rate in the future? What are the consequences of the baby boom for the economic welfare of cohorts born during and after the boom?

3) Is the traditional family "dead" in the United States and other developed countries? Why did the divorce rate double in a decade? Why the growth in female-headed households? Why do so many divorced fathers fail to support their children? Has the sexual division of labor within the family changed as a consequence of the growth of female labor supply? To what extent are these changes in the family caused by social policy, and to what extent are they a product of basic market forces associated with modern economic development? What are the consequences of these changes for the welfare of future generations?

I attempt to touch on some issues from each of the three areas in which the questions are grouped. However, constraints imposed by limitations of space, time, and most im-

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portantly by limitations of my knowledge prevent me from fully addressing in this paper all of these questions or others that might well have been added.

I. The 1960's

In his first paper on fertility determinants, Becker (1960) suggested that parental demand for children could be treated as analogous to the demand for producer or consumer durables, depending on whether parents expected net pecuniary returns from children or received direct utility from them. The most important analytical contribution of this paper was Becker's hypothesis that the cost of children was in part endogenous because parents receive utility from increased child "quality" as well as from increased numbers of children. This hypothesis provided a partial rationale for the empirical observation that family size often tended to be negatively related to family income without recourse to the assumption that children are inferior goods. Thus, an increase in total expenditures on children caused by increased family income might be devoted largely to increased expenditure per child rather than to increases in the number of children, just as an increase in income might lead a consumer to shift from an economy car to a luxury car rather than increase the number of cars.

The development of family economics during the 1960's was closely linked to several other rapidly growing areas of economics. Most notable among these were life cycle theories of consumption (Franco Modigliani and Richard Brumberg, 1954) and human capital (Becker, 1964) and static theories of labor supply (H. Gregg Lewis, 1957; Jacob Mincer, 1962), household production and time allocation (Becker, 1965) and the characteristics approach to consumption (Kevin Lancaster, 1966).

II. The Schultz Volume

The economics of the family emerged as a distinct subfield with the publication in 1973 and 1974 of two special issues of the *Journal*

of *Political Economy* which were reprinted in Theodore Schultz (1974).¹ Papers in this volume consolidated the theoretical work of the previous decade, struck off in new theoretical directions, and began to address the empirical content of the theory with the aid of large-scale micro data sets and new econometric methods.

In the first category, I (1974) presented a model of fertility behavior which synthesized the quality-quantity model suggested by Becker (1960) with a model of household production and human capital investment emphasizing the role of female time allocation between market and home work based on the earlier work of Becker (1964, 1965) and Mincer (1963). This model provides two possible reasons for the negative relationship between income and fertility which may be labelled, respectively, the "female cost of time hypothesis" and the "quality-quantity interaction" hypothesis.

The cost of time hypothesis follows from the assumption that childrearing is relatively more intensive in the use of mother's time than are non-child-related household production activities. When a wife does not engage in market work, I (1974) showed that the shadow value of her time, and hence the marginal cost of children, is an increasing function of husband's income and when women do participate in the market, the cost of time is determined by her (marginal) wage rate. Since the wife's time allocation is endogenous, the model also provides an explanation for the negative correlation between the presence of young children and female labor supply. The cost of time hypothesis suggests that the fertility demand function should distinguish between male and female wages and, in reduced form, that there should be interactions between male and female wages. I (1974) and W. G. Sanderson and I (1971) provided empirical evidence for the interaction effect using U.S. census data.

¹For convenience, citations to these papers will be to the Schultz volume rather than to the specific *JPE* issue.

Both I (1974) and Becker-Lewis (1974) showed that an important implication of the quality-quantity model had been overlooked in Becker's 1960 paper. Specifically, because quality and quantity enter multiplicatively into the household budget constraint, they show that variation in the household's choices of the number and quality of children caused by changes in income or the cost of mother's time induces endogenous changes in the marginal cost of the number and quality of children. For example, if the income elasticity of demand for quality exceeds that for quantity, an income increase will tend to increase the marginal cost of quality relative to quantity, thereby inducing a substitution effect against number of children which may partially or more than offset a positive income effect in favor of children. As I shall explain later, recent work on altruistic preferences and intergenerational transfers has led to some interesting reinterpretations of the quality-quantity model.

The scope of the economic theory of the family was significantly expanded in two other papers in the Schultz 1974 volume. First, Becker introduced a theory of marriage which considers the sources of gains to marriage and formalizes the concept of a marriage market. In his theory, the gains to marriage arise because of gains to the division of labor in household production, because of the joint production of "own children" and other marriage-specific capital and, finally, because of altruistic utility interactions between the marital partners which represent the role of "love." Given this micro-foundation, Becker builds a theory of a competitive marriage market in which individual males and females are matched. He shows that if the joint marital income can be costlessly redistributed between the partners, there will exist a Pareto optimal competitive equilibrium which maximizes the average gain to marriage across the entire population. He also examines patterns of assortative mating in the equilibrium, showing that, under simplifying assumptions, "likes marry likes" when husband's and wife's traits are complementary and "unlikes" marry when they are substitutes.

The second new theoretical direction in the Schultz 1974 volume was provided by Marc Nerlove who suggested that the economic theory of the family could be used as the micro-foundation of a "new Malthusian" theory of population and economic growth. While Nerlove's paper only outlined some of the elements of the theory, it foreshadowed the development of a substantial body of theoretical work during the 1980's to which he among others have made substantial contributions that I will discuss later.

Finally, a number of papers in the Schultz 1974 volume began to address the empirical content of the theory of the family with the aid of large scale micro data sets and new econometric methods. Especially noteworthy were papers by Reuben Gronau and James Heckman which broke new ground in econometric methodology by addressing the question of sample censoring in the estimation of the value of time for nonworking women and in recovering household preference parameters from market data. Again, this work foreshadowed the later development of important new econometric methods by Heckman and others to deal with censoring, self-selection, and longitudinal data issues that arise in models of family behavior. One of the most interesting substantive findings in the volume was by Mincer and Solomon Polachek, who found that interrupted work careers for married women may account for a substantial fraction of the male-female wage gap.

III. Two Schools of Family Economics and the Baby Boom

The theoretical approach represented in the Schultz volume was labelled the "new home economics" by an insider (Nerlove) and the "Chicago School" theory by a variety of outsiders, both within economics and from other disciplines such as demography and sociology in which family and population studies traditionally reside. At the time, the main rival to the Chicago School theory within economics was represented by Richard Easterlin (1969), who was developing an alternative theory which attempted to

synthesize economic and sociological approaches to fertility.

Most notably, Easterlin (1973) sought to explain the postwar baby boom and subsequent baby bust by shifts in preferences for children caused by changes in intergenerational relative income across cohorts. He argued that the desired standard of living of young adults is shaped by the living standards they experience while growing up. If current income is high (low) relative to this standard, they will tend to marry early (late) and have high (low) fertility. According to this hypothesis, cohorts born during the Great Depression and World War II who entered their childbearing years during the postwar boom felt that they could afford large families, while their children, reared in more affluent times and faced by severe labor market competition caused by their large numbers, would tend to delay fertility. To the extent that relative cohort size negatively influences cohort incomes, his hypothesis implies a continuation of endogenous fertility swings into the future.²

Some in the Chicago School viewed any argument based on shifting preferences with suspicion. For example, George Stigler and Becker (1977) argued on methodological grounds that stable preferences should always be posited, although they would permit variations in household behavior to be "explained" with variations in household production technology as well as variation in prices and income. While acknowledging the heuristic value of the distinction between tastes and technology in the household production model, two members of the "Pennsylvania School," Robert Pollak and Michael Wachter (1975), argued (perhaps too strongly) that in practice it is impossible to disentangle variation in behavior caused by these two sources with data on observed household behavior.

The challenge of explaining the postwar baby boom and subsequent baby bust be-

came, for a time, the primary testing ground between the rival approaches. Several studies using aggregate econometric models of postwar fertility behavior have attempted to test both the Easterlin and the Chicago school models with mixed results. For example, R. D. Lee (1977) found support for the relative income hypothesis while William Butz and Michael Ward (1979) obtained results favoring the Chicago model. Indeed, they went so far as to claim that, because of growth in female labor force participation, the female wage effect may have become sufficiently strong to cause "countercyclical" fertility.

Considerable skepticism is warranted about the possibility that aggregate data from one cycle is sufficient to identify either model. Moreover, there is little quantitative agreement between cross-section and time-series estimates of either model. For example, I (1974) completely failed to account for changes in cohort fertility on the basis of my cross-section estimates whereas Butz and Ward's time-series estimates of the Willis model appears to be quite successful in fitting the fertility swing. By the same token, Easterlin (1973) and Lee find that fertility is quite sensitive to variations in relative income measures in aggregate data while Yoram Ben Porath (1975) finds almost no effect of relative income using micro data.³

The division of the economics of the family into rival schools was short-lived. As Sander-son (1976) argued, the two schools had much in common. For instance, both emphasize the importance of household resource constraints in explaining demographic behavior. Additionally, it is interesting to note that, despite the position he takes in Stigler and Becker, Becker's own work increasingly stresses theorizing about preferences including intergenerational linkages within the family (for example, Becker and Robert Barro, 1985). Finally, as the field developed, it attracted new researchers, problems, and approaches not associated with either school.

²More recently, Finis Welch (1979), M. C. Berger (1985), and others have found evidence of significant cohort-size effects on earnings.

³For a more detailed methodological discussion of this work, see T. P. Schultz (1981).

IV. Biology and Fertility Dynamics

As an example of commonality, both Easterlin (1978; Easterlin, Pollak and Wachter, 1980) and members of the Chicago School (Robert Michael, 1974; Michael and I, 1975; Heckman and I, 1976), argued that economists must face the "facts of life" by incorporating the biological aspects of reproduction into models of fertility. That is, to use Easterlin's terminology, it is necessary to analyze the "supply" as well as the "demand" for births. This lead economists to draw on important developments in mathematical demography and biostatistics in which reproduction is represented as a Markov renewal process (for example, E. Perrin and M. C. Sheps, 1964), and suggested the need for a shift from a static to a dynamic framework in economic theories of fertility.

The biology of reproduction implies that fertility decisions are inherently sequential and stochastic. Couples cannot directly choose to have or not have a birth at a given time. Rather, fertility is controlled indirectly by actions such as coital frequency, contraception, and breastfeeding, which determine the risk of pregnancy, and by other actions, such as abortion, which determine whether a pregnancy will result in a live birth. Recognition of these features of the reproductive process led Heckman and me to an attempt to formulate a rational model of reproductive decision making within a stochastic dynamic programming framework, and to recast the empirical framework in which fertility models are tested with data on birth intervals instead of children ever born. While the logic of this dynamic approach to fertility behavior is appealing, it presents serious technical problems in obtaining closed-form solutions to the dynamic program, unambiguous theoretical predictions, or estimable structural econometric models.

Research on dynamic fertility models has been and continues to be an active area of research. Although several attempts have been made (with limited success) to generate more operational dynamic theoretical models (for example, V. J. Hotz and R. Miller,

1985; J. Newman, 1984), most of the activity has been devoted to the development of econometric methods (for example, Heckman and B. Singer, 1984) and to estimates of reduced-form models of birth spacing. In the latter category, several papers indicate that imperfect fertility control and changing opportunity costs over the life cycle play a significant role in explaining fertility behavior (Mark Rosenzweig and Schultz, 1985; Hotz-Miller; Heckman and J. R. Walker, 1986). In addition, P. A. David and T. A. Mroz (1986) use such a model to provide evidence of deliberately controlled fertility before the French Revolution. Another promising line of research by Kenneth Wolpin (1984) attempts to combine theory and structural estimation by formulating a dynamic programming model which is solved numerically in each iteration in the maximization of a likelihood function.

V. Family Instability: Out-of-Wedlock Births, Divorce, and Child Support

To many Americans, the growing instability of the family has been one of the most troubling social developments during the past twenty years. The symptoms of breakdown abound. While fertility in general has fallen, the rate of out-of-wedlock childbearing by teenagers has grown. The divorce rate doubled within the decade 1965-75 and has remained at high levels. Growth in female-headed households has been implicated as a major source of poverty, in part because many fathers fail to pay child support. The economics of the family provides some insights into the underlying causes of family instability, although much work remains to be done on both theoretical and empirical fronts. This section briefly outlines a few of the more interesting contributions in this area from the family economics literature.

A natural starting point for considering out-of-wedlock childbearing, divorce, and nonsupport of children is to ask why long-lasting marital unions have been the norm in so many times and places. Part of the answer stems from the desire of individuals for own children. Suppose, following Yoram Weiss and myself (1985), that an individual's utility

depends on his or her own consumption and on the number and welfare of own children. Since a male and female must cooperate to produce a child, the child's welfare is a collective good from the viewpoint of the parents.

The collective goods nature of children provides a strong rationale for the traditional strategy of first marrying and then having children. Although it is feasible for a woman to have a child without the knowledge of the father, typically it would not be in her interest to do so because, since both parents benefit from the child's welfare, a Pareto optimal allocation of their joint resources requires both to contribute to the child's welfare. Moreover, because of the potential of free riding, an optimal resource allocation is most easily attained when the partners can monitor one another. If monitoring is not easy, as when one partner has custody, the Weiss-Willis model shows that the shadow price of the child's welfare increases to both partners resulting in underexpenditure on the child. Finally, to the extent that marriage entails enforceable contractual elements, a woman is clearly in a better bargaining position if she delays childbearing until after marriage.

The most obvious hypothesis to account for the growth of out-of-wedlock childbearing is the growth of AFDC welfare programs in which the state replaces the father as a source of child support. Despite the strength of the theoretical case for this hypothesis, very little empirical support for it has been found (for example, M. J. Bane and D. Ellwood, 1984). Two recent studies suggest, however, that AFDC effects may be found when empirical analysis is more closely guided by theory than is the case in many of the earlier studies. In one, A. Leibowitz and M. Eisen (1986) argue on theoretical grounds and find empirical support for the hypothesis that AFDC need not affect the rate of teen pregnancy when abortion is available, but that higher AFDC benefits increase the likelihood that a pregnant teen will decide to keep her child. In the other, M. S. Bernstam and P. L. Swan (1986) emphasize the theoretical importance of the competing roles of father's and state resources in determining

childbearing by teenagers. They find significant AFDC effects using state data which controls for the earnings potential of young males.

Most Americans do marry and most children are produced within marriage. However, the rapid growth of divorce means that many of these children will spend at least part of their childhood within a female-headed household and will be exposed to a substantially higher risk of poverty during that period (Bane and Ellwood, 1983; G. J. Duncan and S. D. Hoffman, 1985).

The economic theory of divorce is the obverse side of the theory of marriage. Becker, Landes, and Michael (1977) emphasize the role of uncertainty and imperfect information in accounting for divorce. Thus, while expected gains to the partnership are assumed to be positive at the time of marriage, there is some probability that the net gains will turn out to be negative *ex post* either because the partners are not well suited to one another, or because superior opportunities outside the marriage arise for one or the other partner. Applying the Coase Theorem, they argue that divorce will not occur when one partner would be better off breaking the marriage while the other partner suffers if the latter can compensate the former by a reallocation of income within marriage.

This proposition has received empirical support in a study of the effects of the shift from fault to no-fault divorce laws by Elizabeth Peters (1986). She finds no effect of the type of law on the probability of divorce, but does find that divorce settlements received by women are smaller in no-fault states. The latter finding is consistent with a hypothesis developed in Weiss-Willis which predicts that implicit *ex ante* marriage contracts will provide "divorce insurance" for the custodial parent (almost always the mother) as part of the divorce settlement; no fault removes an important *ex post* source of enforcement of such a contract.

Apart from the suspicion that growth in income transfer programs play a role in contributing to divorce, especially among low-income groups, the main line of theoretical explanation for the increase in the divorce

rate focuses on basic economic forces which cause a decrease in the gains to family life and lead to a shift in the sexual division of labor within the family.

In household production models (for example, Becker, 1965), the family is conceived, in part, as a productive organization in which nonmarket commodities are produced with purchased goods and the time of household members. Efficiency dictates a division of labor within the household and between household and market activities according to the comparative advantage of its members. In an important addition to this argument, Becker (1981; 1985) demonstrates that, because of increasing returns to the rate of utilization, initial differences in comparative advantage will tend to be magnified by optimal investments in skill-specific human capital. Thus, he argues, intrinsic sex differences in the biology of reproduction (or discrimination against women) tend to induce reinforcing investments in the productive skills of men and women, respectively, in market and nonmarket production.

The theory helps to explain the sharp sexual division of labor within the "traditional family" and points to reasons why the division of labor may become less marked as economic development causes an increase in the comparative advantage of market relative to nonmarket modes of production and as market discrimination against women decreases. Decreased specialization in household production together with reduced demand for children, both caused by the rising market value of female time, tend to contribute to a reduction in the gains to marriage and hence to an increase in the probability of divorce. Moreover, increased divorce risk may tend to feed on itself by increasing the pool of eligibles for remarriage and by leading women into precautionary investments in marketable skills as self-insurance against divorce.

Despite the pressures for changes in the sexual division of labor, many observers (even including Becker, 1985) have been struck by the persistence of traditional sex roles within the family in societies and by the failure of intrafamily time allocation to adjust to the growth of female labor force

participation in societies as diverse as the United States, Japan, and the Soviet Union. Microeconomic studies do document some responsiveness in time allocation between husbands and wives in response to variations in husband's and wife's wages (for example, Gronau, 1977), but the magnitude of the variation appears to be modest. The failure of men to take over more responsibility in the home is sometimes suggested as a reason that career-minded women are delaying marriage and childbearing.

To date, few empirical studies have attempted to test such explanations of the divorce explosion. In one, Michael (1986) finds evidence of effects on divorce of male and female wages and of an index of contraceptive technology in a relatively unstructured time-series analysis, but he cautions that the evidence is based on only a single episode. More generally, it has proven difficult to find enough well-measured exogenous variables to permit cause and effect relationships to be extracted from correlations among factors such as the delay of marriage, decline of childbearing, growth of divorce, and increased female labor force participation with aggregate or even micro level data.

VI. Investment in Children, Children's Welfare, and Parental Altruism

In every culture, the family is the primary agent responsible for the care and nurture of children and "family background" is typically found to be one of the most powerful predictors of adult achievement or failure. The conceptual framework for treating the relationship between the family and the welfare of its children has been greatly elaborated since Becker (1960) introduced the term "child quality," measured by the level of expenditure per child, as an object of parental preference. Much of the elaboration is due to Becker.

In his Woytinsky Lecture (1967), Becker argues that the distribution of income from investment in human capital reflects the interaction of variations in the demand for investment and supply of funds across individuals in the population. He emphasizes

that the family may influence demand through its effects on a child's capacity to benefit from investment and influence supply, assuming the child faces borrowing constraints, by its willingness to help finance the investment.

Subsequently, the demand side of this model was recast in terms of Becker's 1965 household production framework in several papers in the Schultz 1974 volume (myself; Leibowitz; D. N. De Tray). These papers assume that child quality is produced with inputs of parental time and purchased goods according to a household technology which may vary with parental characteristics, with the child's innate traits, and with environmental factors. Empirically, Leibowitz focused on inputs, finding that more educated mothers tend to devote more time to child care and are less likely to drop out of the labor market, while De Tray used state data in an attempt to study educational attainment as an output measure.

An unresolved issue in these papers concerns the operational definition of child quality. Is it a scalar, or do the myriad of possible child characteristics such as sex, health, intelligence, personality traits, educational attainment, etc. enter the parent's utility function as separate arguments? The gain in generality of the latter approach is offset by its greater theoretical complexity and by lack of data, although models of sex preference have gone in this direction in part because gender is easily observed (Ben Porath and Welch, 1976).

An alternative strategy stems from Becker's 1974 approach to altruism and Barro's 1974 demonstration that parental preferences can be represented within the overlapping generations framework by a "dynastic utility function" if parents' utility is equal to the sum of their own utility from consumption and the lifetime utility of each of their children multiplied by a weight representing the degree of parental altruism. Because of recursivity, the parents' utility is equal to the sum of the levels of utility from own consumption of their children, grandchildren, and all subsequent generations in the dynasty discounted by the rate of altruism. Given such preferences, a child's level of

lifetime utility (i.e., the weighted sum of his utility from consumption and the utility of his children) can be interpreted as a scalar measure of child quality.

Following this strategy, Becker and Nigel Tomes (1976, 1984) address the determination of the optimal investment in children. Their analysis provides an explicit model of the role of the family in the finance of human capital which had only been discussed informally in the Woytinsky Lecture. To illustrate their approach, consider the following simple example. Suppose that parents are altruistic toward their children, that they face a perfect capital market, and that they can enforce any distribution of family income among family members they desire. Also assume that children cannot borrow to finance their own consumption or human capital investment while they are young.

Taking the number of children as given, parental utility maximization can be represented as a two-stage process in which parents first allocate resources so as to maximize total family wealth by equating the rate of return to investment in human capital for each parent and each child to the rate of interest and, second, distribute the (maximized) wealth among family members so as to maximize a weighted sum of their utilities with the weights determined by the degree of altruism. The level of investment per child is fully determined by the rate of interest and marginal return schedule for human capital, which might vary across children because of innate ability differences. In order to maximize total family wealth, parents reinforce innate ability differences by investing more in children with higher return schedules. Assuming that parents' preferences are egalitarian (i.e., they give equal weight to the utilities of each child) parents will make asset transfers so as to equalize the wealth of each child and, hence, equalize their levels of lifetime utility.

The distribution of wealth between parents and children depends on the degree of parental altruism and, given the degree of altruism, the direction and magnitude of intergenerational transfers within the family depends on the relative (maximized) earnings potentials of parents and children. For

example, relatively wealthy and highly altruistic parents may make positive "bequests" to all children, with more able children receiving smaller bequests. In the converse case, parents may desire asset transfers from their children in order to "repay" in part the parents' cost of childrearing and investment in children's human capital. In this case, redistribution of wealth among children requires asset transfers from more to less able siblings. Transfers from children to parents and among siblings pose obvious enforcement problems which have sparked an interest in issues of "the economics of intergenerational control" (Donald Parsons, 1982).

Optimal fertility is determined when the marginal cost of an additional child, measured by the parents' net expenditure on her or him, is equal to the monetary value of the marginal utility of a birth to the parent, measured by the child's lifetime utility divided by the parents' marginal utility of wealth. A "low-quality" child who receives little investment in human capital thus may be a "high-cost" child if he has wealthy parents who make a large bequest to him and, conversely, a highly educated child of poor parents may be of lower cost because he provides them with sizeable "old age transfers." The net expenditure on a child plays a dual role in this model. It is both an endogenously determined shadow price which induces quality-quantity interactions in the demand for children similar to those described earlier, and it is a measure of the net intergenerational transfer from the older to the younger generation within families.

The model in the example described above contains very strong assumptions about markets, about the form of parental preferences, and about the nature of intrafamily relationships, and it provides a number of strong and testable predictions at both micro and macro levels of analysis. As such, it provides a point of departure for a wide variety of alternative models of the family in which one or another of these assumptions are relaxed or altered and in which alternative empirical hypotheses can be generated about a number of different dimensions of behavior. Space constrains me to mention only a few examples.

Becker and his collaborators have developed the altruism model in a variety of directions including consideration of conditions under which investments in children will compensate or reenforce ability differences, the role of imperfect capital markets, the determinants of intergenerational income mobility, the effect of altruism on incentives of nonaltruistic family members, and the role of population in economic growth.⁴ Others have shown how the empirical implications of the model vary under more general assumptions. For example, Jere Berhman et al. (1982) examine the issue of compensating vs. reenforcing investments in children; B. D. Berheim et al. (1985) show how strategic behavior may influence bequests when children's preferences differ from parents' preferences; and Laurence Kotlikoff and Avia Spivak (1981) demonstrate that intrafamily transfers may substitute for an annuity market in a model without altruism.

The best known implication of the altruism model in macroeconomics is Barro's 1974 "Ricardian Equivalence" result which shows that a public transfer such as pay-as-you-go Social Security will have no effect on real saving, because public intergenerational transfers will be offset dollar for dollar by family intergenerational transfers in the opposite direction. Recently, it has been shown that Ricardian equivalence does not hold when fertility is endogenous because public transfers drive a wedge between the private and social costs of children (D. E. Wildasin, 1985; myself, 1987). For instance, parents have no private incentive to produce children who will pay taxes to support other people in old age; consequently, steady-state fertility will be lower and the capital-labor ratio will be higher in a society with a Social Security transfer program than in one without such a program. My paper (1987) also

⁴See Becker (1981) for a synthesis of and references to his work up to that time and Becker-Tomes (1984) and Becker-Barro (1985) for more recent applications dealing, respectively, with intergenerational mobility and population and economic growth.

points out that this wedge may not occur if Social Security is offset by public intergenerational transfers in the opposite direction such as public schooling; I also show that private fertility choices will be Pareto optimal if there are no market distortions and no net intergenerational transfers through the public sector.

VII. Economic Growth and Demographic Transition

The explanation of the relationship between population and economic growth and development is one of the central challenges to the economics of the family. The theory suggests several possible factors that may be responsible for the demographic transition from high to low fertility which has been associated with the economic development of all the currently advanced societies and in several rapidly growing contemporary developing countries in East Asia and elsewhere.

One explanation of fertility decline, suggested by the "cost of time" hypothesis, is that the increasing value of female time leads to fertility reduction by increasing the relative cost of children. P. Lindert (1980a,b) has shown that the relative cost of children may actually fall during the initial stages of industrialization because the increasing value of child labor offsets the effect of increasing female wages, but documents that an index of child costs does eventually begin to rise as economic development proceeds.

While negative effects of female wages on fertility have been found in many cross-section studies, there are as yet few studies which have attempted to document this effect with historical data. One exception is an interesting and ingenious paper by T. P. Schultz (1985) which uses changes in the relative prices of butter and grain in nineteenth-century Sweden as a natural experiment to test this hypothesis. The basic ideas are 1) that the wage of females relative to males is an increasing function of the relative price of butter to grain because butter was relatively more intensive in female labor than grain; 2) that the relative price of butter to grain is exogenous to labor supply and human capital decisions because these prices

were determined in broad international markets; and 3) that there were substantial fluctuations in the relative price. His findings indicate that the rising value of female time accounted for about one-quarter of the decline of Swedish fertility from 1860 to 1910.

A number of factors may influence fertility through quality-quantity interactions in the demand for children which, as explained earlier in the context of the parental altruism model, will tend to be associated with changes in the return to investments in human capital and in the pattern of intergenerational transfers within the family. An influential theory of demographic transition by the demographer, J. C. Caldwell (1976), hypothesizes that the motivation for high fertility in pretransitional societies stems from intergenerational transfers from the younger to the older generation within the family, and that fertility decline is caused by a reversal in the direction of transfers. While Caldwell suggests that the shift in the direction of transfers is the result of increasing individualism caused by modernizing factors such as growth in mass education and the media, I (1982) argued that the underlying cause of both declining fertility and the changing patterns of intergenerational transfers may be improved technology which increases income and raises the return to investment in human capital by shifting the skill and locational distribution of labor demand.

The literature has also considered to varying degrees a wide variety of other factors that may be responsible for fertility decline including decreased mortality, better contraceptive technology, the growth of public transfers and improvements in capital, insurance, and annuity markets.

VIII. Conclusion

What have we learned from the economics of the family? Family economics has just passed its silver anniversary and its father, Gary Becker, has assumed the presidency of the American Economic Association. As a member of this family of economists, I feel pride in its accomplishments, cheered by evidence that it appears to be rising rather than

falling, and encouraged by its apparently increasing social acceptability by members of other families within economics and the other social sciences.

But what have we learned? We do not have, as yet, a body of empirically tested, quantitatively stable estimates of the major behavioral relationships suggested by the theory. This state of affairs, unhappily, is not unique to the economics of the family for reasons that are all too familiar and it is not likely to be remedied soon. This, despite the fact that econometric technique in family economics is distinctly state of the art.

We do have a growing capacity to generate hypotheses about both large and small questions concerning family behavior and its consequences within a theoretical framework that is a logically coherent part of the main corpus of neoclassical economic theory. This permits a rich cross fertilization between family economics and other branches of economics that has already borne fruit many times. There is no alternative theory of demographic behavior that comes close in terms of either scope or power. We have a modest body of rejected null hypotheses—yes, economic variables do influence family behavior, often in the direction suggested by the theory—and, as the field has matured and attracted theorists with more varied viewpoints we are beginning to see more sophisticated null hypotheses. Finally, the scope and quality of data on families, both domestically and abroad, has grown enormously during the past twenty-five years. There is even the start of interaction between the theorists and econometricians and the data gatherers. I predict that our family will survive to its golden anniversary.

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