AN ECONOMIC ANALYSIS OF THE FAMILY

GARY S. BECKER

Gary S. Becker is Professor of Economics and Sociology at the University of Chicago. This paper has been accepted for publication by the Institute which is not responsible for either the content or the views expressed therein.

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Introduction

It is a great pleasure to be invited to give the Geary Lecture. R. C. Geary was an impressive contributor to many disciplines. As a statistician he is best remembered for his work on the use of instrumental variables to correct for errors of measurement, and for his analysis of departures from normality in the distribution of errors. In economics, he contributed to utility theory and to the analysis of input-output models. His two-page note on the so-called Stone-Geary utility function worked out the important properties of this function. His work in sociology mainly centred around the analysis of population change. My interests overlap his in both economics and sociology. I hope that he would not have been too sceptical about a lecture on the economic analysis of the family.

Families have been a major force in the production and distribution of goods and services in virtually every known society — including ancient, primitive, developing, and developed societies. They have been especially important in the production, care and development of children, in the production of food, in protecting against illness and other hazards, and in guaranteeing the reputation of members. Moreover, parents have frequently displayed a degree of self-sacrifice for children and each other that is testimony to the heroic nature of men and women.

Of course, families have radically changed in the course of recorded history. The detailed kinship relations in primitive societies traced by anthropologists contrasts with the predominance of nuclear families in modern societies, where cousins often hardly know each other, let alone interact in production and distribution. The obligations in poor societies

to care for and maintain elderly parents is largely absent in modern societies, where the elderly either live alone or in nursing homes.

Nevertheless, families have been much less prominent in economic analysis than in reality. Although the major economists have claimed that families are a foundation of economic life, neither Marshall's *Principles of Economics,* Mill's *Principles of Political Economy,* Smith's *Wealth of Nations* nor any of the other great works in economics have made more than casual remarks about the operation of families.

Indeed, until recent decades, economists essentially ignored the family, perhaps because family decisions were rather simple during the nineteenth and early twentieth centuries. Women were primarily interested in marriage, and married women did not work in the market-place. This meant an almost complete sexual division of labour between husbands and wives; husbands worked for income and wives did housework. In addition, divorce in Western societies was very uncommon until the twentieth century. The economic role of families apparently did not change sufficiently to attract serious attention from earlier economists.

Some economists did discuss age at marriage. Malthus' theory of population change depended on the relation between fertility, earnings, and age at marriage. He advocated later age at marriage, and hence less opportunity to bear children, when economic circumstances are less favourable. Poorer persons in Western Europe did generally marry quite late, being almost aged thirty in Western Europe in earlier centuries, and over the age of thirty in the late nineteenth and the early twentieth century in Ireland (Walsh, 1985).

The economic role of families has changed rapidly during the past fifty years. More than half of all married women in the United States, and over 80 per cent of married women in Sweden and the Soviet Union now participate in the labour force. Fertility greatly declined in practically all Western countries since the end of the Second World War, and is now below replacement in many countries. Even Ireland, which has traditionally had much higher fertility rates than other Western countries, saw a drop in fertility by more than 20 per cent during the past five years (Central Statistics Office, 1985).

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Divorce rates in the West have increased rapidly. About two-fifths of all persons marrying for the first time in the United States can anticipate getting divorced. Cohabitation and births to unmarried women have become common. Children from first and second marriages frequently share the same household. Investments in children loom large as families spend on their education and training, and worry more about the well-being of each of the fewer children that they have. The State has taken over from families much of the support of the elderly, with important consequences for private savings and interactions among family members.

As a result, economists have finally begun to analyse family behaviour in a systematic way. Indeed, no aspect of family life any longer escapes interpretation with the calculus of rational choice. This includes esoteric subjects like why some contraceptive techniques are preferred to others, or why polygamy has become less common in the Middle East, as well as more traditional subjects, including age at marriage, family size, investments in the human capital of children, and expenditures on the care of elderly parents. This essay sets out the essence of the "economic approach" to various aspects of family behaviour.

Fertility

Let us start with the Malthusian problem: what determines the number of children, or fertility, of a typical family? Crucial to any discussion is the recognition, taken for granted by Malthus, that men and women strongly prefer their own children to the children produced by others. The desire for own children means that the number of children in a family is affected by supply conditions. These include knowledge of birth control techniques, and age, nutrition, health, and other variables that affect the capacity to produce children.

In a simple formulation, the demand for children is determined through maximisation of the utility of a family that depends on the quantity of children and an aggregate of other commodities. The basic theorem of consumer theory states that an increase in the relative price of a good reduces the demand for that good when real income is held constant. If the

qualification about income is ignored, then, in particular, an increase in the relative price of children reduces the children desired by a family. The net price or cost of children is reduced when opportunities for child labour are readily available. This implies that children are more valuable in traditional agriculture than in either cities or modern agriculture, and explains why fertility has been higher in traditional agriculture (Jaffe, 1940; Gardner, 1973).

Production and rearing of children have usually involved a sizeable commitment of the time of mothers, and sometimes also that of close female relatives. Consequently, a rise in the value of mother's time would reduce the demand for children by raising the relative cost of children. In many empirical studies of primitive, developing, and developed societies, the number of children has been found to be negatively related to various measures of the value of mother's time (Locay, 1957; Mincer, 1962; Makhija, 1977).

Women with children have an incentive to engage in activities that are complementary to child care, such as work at home in a family business, or sewing and weaving at home for pay. Similarly, women who are involved in complementary activities are encouraged to have children because children then do not make such large demands on their time. This explains, for example, why women on dairy farms have more children than women in grain farms: dairy farming inhibits off-farm work, and farm work is more complementary with children than off-farm work (Sander, 1986). A recent study for Japan shows that women who work for pay while at home or who work in a family business have about as many children as women who do not work (Osawa, 1985).

During the past one hundred years, fertility declined by a remarkable amount in all Western countries. Married women in the United States now average a little over two live births compared to about five-and-a-half live births in 1880 (US Bureau of the Census, 1977). The total fertility rate in West Germany is down to 1.4, so that German families are far from reproducing themselves. Economic development raised the relative cost of children in several ways. Agriculture declined, the value of time spent on child care increased, and child labour became less useful in advanced economies. Parents

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substituted away from number of children toward expenditures on each child as human capital became more important in the technologically advanced economies of the twentieth century (Becker, 1981, chapter 5).

"Quality" of Children

The economic approach contributes in an important way to understanding fertility by its attention to the "quality" of children. Quality refers to characteristics of children that enter the utility functions of parents. Quality has been measured empirically by the education, health, earnings, or wealth of children. Although luck, genetic inheritance, government expenditures, and other events outside the control of a family help determine child quality, it also depends on decisions by parents and other relatives.

The quality and quantity of children interact not because they are especially close substitutes in the utility function of parents, but because the true (or shadow) price of quantity is partly determined by quality, and vice versa. The relative cost of a child depends on the amount spent on the child; that is, it depends on a determinant of the quality of the child. Similarly, the cost of improving quality depends on the number of children because an increase in the number of children raises the total amount that must be spent to increase the quality of each child. The effect of quality of children on the cost of each child, and the effect of number of children on the cost of improving quality, means that there is an interaction between the responses of quantity and quality of children to changes in the cost of children and family income.

To illustrate this interaction, consider a rise in the cost of quantity that reduces the demand for number of children. A reduction in number, however, lowers the price of quality, and thereby stimulates the demand for quality. The increase in quality, in turn, raises further the shadow price of quantity, which reduces further the number of children, which induces a further increase in quality, and so on until a new equilibrium is reached. Therefore, a modest increase in cost could greatly reduce the number of children and greatly increase their quality, *even when quantity and quality are not good substitutes in the utility function.*

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The interaction between quantity and quality can explain why large declines in fertility are usually associated with large increases in the education, health, and other measures of the quality of children (Becker, 1981, chapter 5). It also explains why quantity and quality are often negatively related within families: evidence for many countries indicates that years of schooling and the health of children tend to be negatively related to the number of their siblings (DeTray, 1973; and Blake, 1981).

The influence of parents on the quality of their children links family background to the achievements of children, and hence links family background to inequality of opportunity and inter-generational mobility. Other social scientists have dominated discussions of inter-generational mobility, but in recent years economists have used the concepts of investment in human capital and bequests of non-human wealth to model the transmission of earnings and wealth from parents and children (Conlisk, 1974; Loury, 1981; and Becker and Tomes, 1986). These models show that the relation between, say, the earnings of parents and children depends not only on biological and cultural endowments "inherited" from parents, but also on the interaction between these endowments, government expenditures on children, and investments by parents in the education and other human capital of their children.

Several empirical studies for Western Countries find rapid regression to the mean across generations in the earnings of parents and children. The grandchildren of persons with very high or very low earnings can expect to have about the same earnings (Becker and Tomes, 1986).

Altruism in the Family

I have followed the agnostic attitude of economists to the formation of preferences, and have not specified how quality of children is measured. One analytically tractable and plausible assumption is that parents are altruistic toward their children. By "altruistic" is meant that the utility of parents depends on the utility of children.

Economists have generally explained market transactions

with the assumption that individuals are selfish. In Smith's famous words, "It is not from the benevolence of the butcher, the brewer, or the baker, that we expect our dinner, but from their regard to their own interest. We address ourselves, not to their humanity but to their self-love, and never talk of our own necessities but of their advantages."

The assumption of selfishness in market transactions has been very powerful, but will not do when trying to understand families. Indeed, the main characteristic that distinguishes family households from firms and other organisations is that allocations within families are largely determined by altruism and related obligations, whereas allocations within firms are largely determined by implicit or explicit contracts among selfish members. Since families compete with governments for control over resources, totalitarian governments have often reached for the loyalties of their subjects by attacking family traditions and the strong loyalties within families.

The preference for own children mentioned earlier suggests special feelings toward one's children. Sacrifices by parents to help children, and vice versa, and the love that frequently binds husbands and wives to each other, are indicative of the highly personal relations within families that are not common in other organisations (Ben-Porath, 1980; and Pollak, 1985).

Although altruism is a major integrating force within families, the systematic analysis of altruism is recent, and many of its effects have not yet been determined. One significant result has been called the Rotten Kid Theorem, and explains the co-ordination of decisions among members when altruism is present but limited in scope. In particular, if one member of a family is sufficiently altruistic toward other members to spend time or money on each of them, they have an incentive to consider the welfare of the family as a whole, *even when they are completely selfish.*

To illustrate this, consider a parent who is altruistic toward her two children, Tom and Jane, and spends say $200 on each. Suppose Tom can take an action that benefits him by $50, but would harm Jane by $100, a selfish Tom would appear to want to take that action if his responsibility for the changed circumstances of Jane were to go undetected (and hence not punished). However, the head's utility would be reduced by

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Tom's action because family income is reduced by $50. If altruism is a "superior good," the head will reduce the utility of each beneficiary when her own utility is reduced. Therefore, should Tom take this action, she would reduce her gift to him from $200 to less than $150, and raise her gift to Jane to less than $300. As a result, Tom would be made worse off by his action.

Consequently, a selfish Tom who anticipates correctly the response from his parent will not take this action, even though the parent may not be trying to "punish" Tom because she may not know that Tom is the source of the loss to Jane and the gain to himself. This theorem only requires that the head knows the outcomes for both Tom and Jane and has the "last word" (this term is due to Hirshleifer, 1977).

Under some circumstances, therefore, an invisible hand of altruism complements Adam Smith's invisible hand of selfishness. The automatic responses of an altruist then induces even selfish beneficiaries to act as if they are altruistic, and to serve ends that are no part of their intent. In the same way, a well-functioning market system induces selfish participants also to act as if they were altruistic, and to contribute to social welfare even though that is no part of their selfish preferences.

Although this theorem is also applicable when children and other beneficiaries are envious of each other, it does not rule out conflict in families with altruism. Sibling rivalry, for example, is to be expected when children are selfish because they want larger gifts from their parents. Each would try to convince the parents of his or her merits. Conflict also arises when several members are altruistic to the same beneficiaries, but not to each other. For example, if parents are altruistic to children but not to each other, each benefits when the other spends more on the children. Parents living together might readily work out agreements to share the burden, but divorced parents have a more serious conflict. Non-custodial parents (usually fathers) often fall behind in their child support payments partly to shift the burden of support to custodial parents (see the discussion in Weiss and Willis, 1985).

Altruism provides many other insights into the behaviour of families. For example, an efficient division of labour is possible

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in altruistic families without the usual principal-agent conflict because selfish as well as altruistic members consider the interests of other members. Or contrary to some opinion, bequests to children and gifts inter vivas are not perfect substitutes in altruistic families. Bequests not only transfer resources to children but also give children an incentive to take account of the interests of elderly parents because parents then have the "last word" (Becker, 1981, chapter 5; and also Bernheim, Schleiffer and Summers, 1985).

The Sexual Division of Labour

A sharp division of labour in the tasks performed by men and women is found in practically all societies. Women have had primary responsibility for child care, and men have had primary responsibility for hunting and military activity. Even when both men and women engaged in agriculture, trade, or other market activities, they generally performed different tasks (Boserup, 1970).

A substantial division of labour is to be expected in families, not only because altruism reduces incentive to shirk and cheat (see the last section), but also because of increasing returns from investments in specific human capital, such as skills that are especially useful in child-rearing or in market activities. Specific human capital induces specialisation because investment costs are partially (or entirely) independent of the time spent using the capital. For example, a person receives a higher return on his medical training when he puts more time in to the practice of medicine. Similarly, a family is more efficient when members devote their time to different activities, and each invests mainly in the capital specific to his or her activities (Becker, 1981, 1985; for developments of this argument outside families, Rosen, 1981, and especially Murphy, 1986).

The advantages of a division of labour within families does not alone imply that women do the child-rearing and other household tasks. However, the gain from specialised investments implies the traditional sexual division of labour if women have a comparative advantage in childbearing and child-rearing, or if women suffer discrimination in market activities. A sexual division of labour segregates the activities of

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men and women, and segregation is an effective way to avoid discrimination (Becker, 1971). Therefore, even small differences in comparative advantage, or small amounts of discrimination against women, can induce a sharp sexual division of labour.

Until recently, the sexual division of labour in Western countries was extreme; for example, in 1890, less than 5 per cent of married women in the United States were in the labour force. In 1981, by contrast, over 50 per cent even of married women with children under age six were in the labour force (Smith and Ward, 1985). However, the occupations of employed men and women are still quite different, and women still do most of the child-rearing and other household chores (*Journal of Labor Economics*, January 1985).

The large growth in the labour force participation of married women during the twentieth century is mainly explained by the economic development that transformed Western economies. Substitution toward market work has been encouraged by the rise in the potential earnings of women (Mincer, 1962). Moreover, the growth in clerical jobs and in the service sector gave women more flexibility in combining market work and child-rearing (Goldin, 1984). In addition, the large decline in family size (see section 2) greatly facilitated increased labour force participation by married women. of course, the rise in participation of women also discouraged child-bearing.

Divorce

Since women have specialised in child care, they have been economically vulnerable to divorce and the death of their mates. All societies have recognised this vulnerability by requiring long-term contracts, called "marriage," between men and women legally engaged in reproduction. In Christian societies, these contracts often could not be broken except by adultery, abandonment, or death. In Islam and Asia they could be broken for other reasons as well, but husbands were required to pay compensation to their wives when they divorced without cause.

Divorce has grown remarkably rapidly during this century

in Western countries. Essentially no divorces were granted in England prior to the 1850s (Hollingsworth, 1965), whereas now almost 30 per cent of marriages there will terminate by divorce, and the fraction is even larger in the United States, Sweden, and some other Western countries (see United Nations, 1977). What accounts for this huge growth in divorce over a relatively short period of time?

The utility-maximising rational choice perspective implies that a person wants to divorce if the utility expected from remaining married is below the utility expected from divorce, where the latter is affected by the prospects for remarriage. Indeed, most persons who divorce in Western countries do remarry eventually (Becker, Landes and Michael, 1977). This simple criterion is not entirely tautological bacause it helps isolate several determinants of the gain from remaining married.

Some persons become disappointed because their mates turn out to be less desirable than originally anticipated. That new information is an important source of divorce is suggested by the large fraction of divorces that occur during the first few years of marriage. Although disappointment is likely to be involved in most divorces, the large growth in divorce rates during the past twenty years is not to be explained by any sudden deterioration in the quality of information. Instead, we look to forces that eliminated the advantages from remaining in an imperfect marriage.

The drop in fertility encouraged divorce because the advantages from staying married are greater when young children are present. Conversely, fertility fell partly because divorce became more likely: married couples are less inclined to have children when they anticipate a divorce (see *ibid* for supporting evidence). Divorce rates were also raised by the higher labour force participation of married women. This reduced the sexual division of labour and made women more independent financially. At the same time, the labour force participation of married women increases when divorce is more likely since married women try to acquire skills that would raise earnings if they must support themselves after a divorce.

The economic analysis of the family is helpful also in analysing the effect of social security, budget deficits, subsidies to education, and other public policies. Let us consider a few examples.

In most Western countries, transfer payments available to a poor family — that is, welfare payments — increase as the number of children in the family increases. Such a system raises the number of children in poor families by lowering the cost of children. Since welfare payments are usually higher when the family income is lower, they also raise the resources of unmarried poor women compared to married women. This would discourage marriage and encourage marital separations and divorce. Therefore, welfare encourages births by unmarried mothers. A recent study for the United States suggests that welfare has significantly raised the illegitimate birth rates of poor white and black women (Bernstram and Swan, 1986).

Of course, any public policy has some adverse effects on incentives. A programme may still be desirable if the benefits are large relative to the effects on incentives. Welfare payments are said to raise the education, health, and other human capital of poor children. This may appear to be a reasonable conclusion because a portion of these payments is likely to be spent on the children.

However, welfare may reduce family income if it discourages marriage. Moreover, recall the analysis of the interaction between the quality and quantity of children. A larger number of children in poor families raises the cost of improving the quality of these children. For example, the attention paid to each child could well decline when the number of children that require attention increases. Therefore, the interaction between quality and quantity implies that the positive effect of welfare on the number of children will produce a negative effect on the well-being of each child. Paradoxically, even if family incomes rose, welfare payments could lower the well-being of each child in families on welfare.

Little empirical evidence is available on the effects of welfare

on children. In particular, I do not know of evidence for the United States that indicates strong positive effects of welfare on the well-being of children in poor families.

Social security payments to the elderly have grown rapidly in all Western countries during the past fifty years. Economists have worried about the effects of these payments on private savings. Young persons no longer need save as much to provide for their old age because they expect to receive social security income (see the argument in Feldstein, 1974). However, this analysis fails to realise that the young persons who are taxed to subsidise the elderly are the children or grandchildren of these elderly. Therefore, social security is an indirect way for younger generations within a family to support older generations.

Indeed, social security is, in effect, a tax on children that is used to support their parents. However, altruistic parents would try to offset the effect of the tax on children by raising their gifts and bequests. Barro (1974) and others have shown in simple models that compensatory transfers from the elderly to their children will fully offset the taxes on the young. Social security would then not lower private savings. Empirical studies have not always found a strong negative effect of social security on private savings (see the evidence in Barro, 1978; and in Munnell, 1974).

The economic analysis of the family gives further insights into the effects of social security. A tax on the young to finance transfers to the elderly lowers the net wage received by children, which raises the full cost of children to altruistic parents. A rise in costs reduces the demand for children. Moreover, the interaction between quality and quantity implies that the amount spent on each child increases when the number of children falls.

Therefore, a fuller analysis of social security gives even more surprising results than the "Ricardian-equivalent theorem" of simple models. Social security reduces birth rates and raises saving and the per capita stock of capital bequeathed to future generations. Perhaps the rapid growth in social security payments in Western countries during the past fifty years has contributed to the low birth rates during this period (Becker and Barro, 1985, treat this issue more fully).

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In recent decades, Western countries have greatly liberalised divorce laws. For example, most states in the United States no longer require either mutual consent to a divorce or "fault" by one spouse. Instead, states now grant unilateral or no-fault divorce, where husbands and wives can obtain a divorce without the permission of their spouses and without proving faulty behaviour. Many people believe that such liberalisation of divorce laws is an important contributor to the present high rates of divorce.

Further analysis casts considerable doubt on this conclusion. Even radical changes in divorce laws do not significantly raise the likelihood of divorce. To show why, assume that Tom would expect the "wealth equivalent" of, say, $80,000 if he divorced, and that his wife Jane would expect, say, $50,000. Assume also that their combined "wealth" if they stay married is $150,000, and that initially this is divided 50-50. With a requirement of mutual consent, Jane would refuse to agree to a divorce because divorce lowers her wealth by $25,000. Now, it might seem that Tom would divorce if unilateral divorce is possible because divorce raises his wealth by $5,000. However, if the 50-50 split of their married wealth can be changed, Jane could reduce her share to, say, 40 per cent, which would increase Tom's married wealth to $90,000. Both are then better off by staying married, and they would not divorce. Mutual consent and no fault give the same outcome: no divorce.

This example can be generalised to the conclusion that divorce rates are largely independent of divorce laws (assuming that divorce is possible). Sceptics might respond that this is fine in ivory tower theory where scorned wives and husbands do not seek revenge. To see whether the real world mirrors the ivory tower, I did a simple analysis of the effect on the divorce rate in California when it became the first state to adopt a unilateral divorce law. I did not find any permanent increase in the divorce rate due to the law (Becker, 1981, chapter 10). Elizabeth Peters' (1986) systematic and empirical analysis for all states in the United States also finds no positive effect of unilateral divorce laws on divorce rates.

However, the movement to unilateral divorce laws has worsened the economic position of divorced women. The

requirement of mutual consent forces a husband who wants a divorce to "bribe" his wife to obtain her consent. By contrast, under unilateral divorce, he does not need to offer her any bribe. Since men have been more interested in divorce than women, a replacement of mutual consent by unilateral divorce would harm divorced women. Both the study by Peters and a study of divorces in California by the sociologist Lenore Weitzman (1985) confirm this implication also of the theory.

Concluding Remarks

Families are important producers as well as spenders. Their primary role has been to supply future generations by producing and caring for children, although they also help protect members against ill health, old age, unemployment, and other hazards of life.

Families have relied on altruism, loyalty, and norms to carry out these tasks rather than the contracts found in firms. Altruism and loyalty are concepts that have not been utilised extensively to analyse market transactions, and our understanding of their implications is only beginning. Yet a much more complete understanding is essential before it is possible to analyse fully the behaviour and evolution of families.

Firms and families compete to organise the production and distribution of goods and services. Activities pass from one to the other as scale economies, principal-agent problems, and other forces dictate. Family firms that combine production for the market with production for members have dominated agriculture and many retailing activities. Presumably, such hybrid organisations are important when altruism and loyalty are more effective than contract in organising market production (Becker, 1981, chapter 8; and Pollak, 1985), and when the production and care of children complements production for the market.

Although families in Western countries have changed drastically during the past thirty years, obituaries for the family are decidedly premature. Families still produce and rear children, and remain important protectors of members against ill-health, unemployment, and many other hazards.

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The social role of families will evolve further in the future. Yet I am confident that they will continue to have primary responsibility for children, and that altruism and loyalty will continue to bind parents and children.

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