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The Economic Theory of Fertility Over Three Decades

WARREN C. ROBINSON

INTRODUCTION

The 'economic model' has, for the last 15 to 20 years, been the dominant explanatory paradigm in fertility and family planning studies. This framework dates from the work of Leibenstein and Becker in the late 1950s and early 1960s.¹ Once introduced, the economic approach caught on quickly and by the second half of the 1970s had become, by all odds, one of the most widely used frameworks in this study of fertility.²

It is possible to argue that this intellectual triumph was not really very difficult. The sociological and psychological paradigms used by fertility researchers in the forties and early fifties had proved notably unhelpful in interpreting and organizing the growing volume of data collected in large-scale surveys. Demography had become a strong, well-established empirical discipline, badly in need of theoretical guidance.³ The economic model satisfied this need by arguing that fertility is a result of conscious decision and deliberate purposeful action. It is nothing more than a special case of 'consumer demand' theory and the process lends itself to analysis, understanding and prediction based on a simple intuitive micro-economic model. Most social scientists interested in fertility have found this a congenial, comfortable idea.⁴

Easterlin added a supply function to the picture in his 'synthesis framework'⁵ rounding out the model and it has now become conventional to group explanatory variables into 'demand' and 'supply' categories. Almost from the beginning, the authors involved have stressed the link of the theory to policy and programme interventions.⁶ This framework has, in fact, guided much of the recent research in the area, including large projects undertaken by the U.S. National Academy of Sciences and the United Nations Population Fund (Bulatao and Lee 1983).⁷ An enormous, highly sophisticated technical literature is available, yet solid micro-economic conclusions and new policy-relevant implications have proven curiously elusive.⁸

Even with a growing volume of data on fertility and contraceptive practice as such, and ever more sophisticated statistical methods, it is still possible

to debate whether couples do or do not plan their family size precisely; and if they do what costs and benefits enter into the calculation, or how they can be measured. Programmatic and policy questions which were confidently addressed a couple of decades ago remain unanswered today. Population policy continues to be largely *ad hoc* with no real theoretical foundation and uncertainty remains about the most basic macro-economic questions: the role of population growth in the development process; and what government policies are appropriate under what conditions.⁹ In short, the economic approach has not lived up to early expectations. Why is this?

THE BASIC DEMAND THEORY FRAMEWORK

The theory dates from the effort in 1957 by Harvey Leibenstein to formalize the turning point, the process by which fertility declines, in the demographic transition. He explains that: 'the essence of the model is the presumption that families would balance utilities against disutilities ascribed to an *n*th child to determine whether a family wanted an *n*th child'.¹⁰ Leibenstein focused on the decision-process, at the margin, where a couple could rationally choose whether or not to have another child.

A bit later Gary Becker reformulated this approach into a more general model of completed fertility, based on the familiar neo-classical assumptions of fixed preferences, maximizing behaviour and the existence of equilibrium solutions for all decision situations.¹¹ Becker adapted his model to the household production function paradigm, linking the fertility decision to other household economic processes, including labour force participation and consumption.

This notion of the 'household production function' is basic to contemporary micro-economic theory: the household itself is the unit which produces its own ultimate utility using internal and purchased external resources and employing a particular 'household technology'.¹² This implies that the 'demand' for children is actually a demand by parents for the flow of services which children produce for them over time. Consumption of these

child-services generates pleasure or 'utility' for the parents (the household). These child-services (and other services) are produced within the household using the time and labour of the household members and inputs purchased from outside the household, and employ the 'technology' possessed by the household for such production.

The household maximizes its total utility by using the constrained total resources available to it so as to equate the utility per unit of resource expenditure received at the margin from the various products and services consumed. This leads to a utility-maximizing equilibrium, such that no reallocation of available resources would increase total utility. More recent versions of the model have added 'altruism' as a source of utility to the decision-maker (meaning that the utility of other household members 'matters') and extended the maximizing process so as to be 'dynastic': the present decision-maker acts on behalf of future generations by making bequests and investments in addition to current expenditures.

At the base of the theory is the proposition that children are a special type of capital goods. They are relatively long-lived assets which produce a flow of services over time, and which involve initial acquisition and periodic upkeep costs. Their value derives from the flow of services they produce, which in turn produces utility for the parents. Like most capital goods (children were called 'consumer durables' in some of the early economics-of-fertility papers but this terminology has not been used recently, perhaps because it met with such scorn from the early sociological critics),¹³ children can produce a larger or smaller volume of final services depending on the underlying embodied technology. A 'higher' technology means a larger volume of child-services per child.

One of the economic puzzles about the historical experience of the European demographic transition was why fertility fell as incomes increased. At first glance this suggested that the demand for child-services was inversely related to income, making it 'an "inferior good" with a low or even negative income-elasticity of demand'. (Such goods are 'inferior' in the sense that they are chosen only when income is very low and all competing goods exceed the consumer's budget constraint. If income increases, the other 'superior goods' are chosen instead.) This seemed counter-intuitive to Becker since he assumed children were a unique asset with no close substitutes.¹⁴ He solved this conceptual problem by adding the notion of 'child quality' to the model and this concept lies at the heart of all his subsequent theorizing.¹⁵ The demand is not for

children, but for child-services, the flow of utilities produced for the parents by their offspring. But total child-services equals number of children times an average quality per child. Child-quality is elastic with respect to income, while quantity is not. As income has increased, demand for child-services has, indeed, risen when the quality dimension is added, even though the number of children demanded has fallen.

Thus, the key change over the course of the fertility decline is a preference shift towards higher-quality children, who require more purchased external inputs (particularly resources for education and health) and are more time-intensive within the household. Women's labour force participation and real wages have risen over time, and thus the cost of the relatively time-intensive child-quality has increased even more sharply. So the cost per child has risen and the number of units demanded fallen.¹⁶

At first glance, quality and quantity would appear to be substitutes, but in Becker's formulation their relationship is multiplicative and interactive. They do not trade-off against one another, but each is partly determined by the other.

What then is child-quality? Becker's early statements refer to quality simply as a 'bundle of attributes',¹⁷ all those qualities of the child which make it more attractive, or more valuable to the parents. Measuring this quality has proved to be difficult. Some authors have taken the educational expenditure per child as the price of quality, while others have chosen to consider it simply as a 'latent variable' inherently non-measurable.¹⁸ More recently, several authors have refined, but also broadened, the definition still further. Razin and Sadka write: 'Child quality is a multi-dimensional construct consisting of nutrition, education, skill development, health care and so forth'. And: 'The improvement in the quality of a child can be done in a variety of ways: spending on the current consumption of a child, investing in the child's health or education (investing in human capital) and providing for the child's future consumption (bequest)'.¹⁹

Cigno has proposed an even more sweeping definition of quality. 'The maximum amount of goods which a person can gain access over by his or her best endeavours over a lifetime given the level of parental benefactions received' (Cigno 1994, p. 86).²⁰ This would be approximated by the value of all the parents' home-time inputs, plus all purchased inputs, plus all bequests.

Thus, quality now is understood to include the well-being, present and future, of the child, as well

as the utility this creates for the parents. The parents aim at maximizing a multi-generational ('dynastic') utility function, and hence bequests and investments as well as current expenditures become purchases of quality. Quality becomes, in effect, a residual 'measured' by all past, present and future expenditures on children by their parents, and perhaps by the children themselves.

As will be seen from this brief exposition, the theory has become complex and somewhat esoteric. In fact, most of these assumptions and propositions are not essential to the theory's ability to explain fertility declines as economic development occurs. The relative time-intensity of the technology required to produce child-services (of whatever quality) compared to other household-production and a rising value of household time-labour because of rising labour force opportunities for women would seem sufficient in themselves to achieve this logical result.²¹ Much of the theoretical complexity is self-driven and far removed from policy considerations.

This is a rough outline of the Becker/Chicago demand theory of fertility. It has become dominant because of its rigour, its elegance and its simplicity. It is what most people understand when they write of the 'economic approach' to fertility. Yet, this theory leaves out many important considerations and glosses over important difficulties which seriously impair its usefulness as a guide to policy interventions.

PROBLEM 1: THE JOINTNESS OF DEMAND

The flow of services produced by children is in a very real sense a joint product – the physical activities which produce children also give sexual pleasure. Whatever can be said about the usefulness or satisfaction derived from child-services, sexual activity is clearly desired for its own sake. It is a powerful drive affecting behaviour for a large part of most adults' lives. Experience in low-fertility countries suggests that it continues to be an important desire even when the demand for the joint product, child-services, is weak or non-existent. If one assumes that sexual desire is a datum, then children are often merely an unintended by-product. Access to convenient, effective contraceptive methods weakens, but does not totally eliminate, this jointness.

There are some further implications of this jointness. Some couples may be unaware (or only vaguely aware) that the two outcomes – sexual enjoyment and children – need not always be inescapably linked, and that one can be enjoyed

without the other. Other couples may believe that any effort to prevent pregnancy will reduce their enjoyment of sexual intercourse. For such couples a strong desire for coitus will produce children even when the demand for child-services is weak, or negative.²²

In fact, the latter seems to be common case. In most pre-modern societies means of attempting to break this jointness of production were known, but they usually affected sexual pleasure – abstinence, withdrawal, non-vaginal intercourse, or crude barrier methods.

If these measures are rejected (or fail) to prevent a pregnancy, couples who demand sexual pleasure, but not children can still attempt to prevent a live birth by abortion, infanticide, or child abandonment. The very widespread resort to such practices in nearly all pre-modern cultures suggests that many pregnancies and births were unintended and unwanted by-products of sexual activity.

Given this fact, a high level of actual fertility tells us very little about the demand for children *per se*. It may simply reflect a strong desire for sexual pleasure, together with ignorance of means of eliminating the by-product, or a belief that the means known are ineffective or reduce sexual pleasure.

A true demand function for children (child-services) can only be postulated when jointness of production of children and sexual pleasure has been broken by the general availability of acceptable and effective contraception. The point has been almost totally overlooked in the extensive literature which deals with the demand for children.²³

PROBLEM 2: THE UNUSUAL COMPLEXITY OF CHILD-SERVICES

Leibenstein has argued that three types of utility accrued to parents from having children: (1) a consumption utility; (2) a labour productivity utility; (3) an old-age security utility.²⁴ These still seem intuitively valid and cover most, if not all, possible utilities which might lead parents to want children. (The consumption can be understood to include emotive, psychological and other 'non-economic' benefits). Each utility is presumably connected with a type of child-service provided by the child to its parents.

These three types of child-services accrue to the parents in different ways, with consumption services being greatest in childhood, labour services greatest in adult life and old-age security services greatest in the middle age of the child. If we assume that

parents discount these future flows, the consumption utility, being closest to the present, will always loom larger than the other two types.

It is possible to imagine that a couple might value the consumption-services provided by children very highly and yet expect no labour-services or future economic support. The evaluation of child labour and future old-age security services could well be negative if the couple did not expect to receive any economic transfers from their children, but rather anticipated continuing to support them well into their adult lives. The point is that even though children are capable of producing all three types of service to parents, this does not mean that all parents in all situations expect to receive them. The fertility transition, as Leibenstein and others have noted long ago, was probably driven more by a decline in the expected overall utility of child-services rather than by a shift in consumer preferences towards quality over quantity.

Similar considerations arise when we think of fertility decisions as a sequential series, each based on the experience with the last child, and the then prevailing price, income, and other factors. We cannot assume that all children will be viewed as being valuable because it can be shown that in some circumstances some children are valuable. Most assets yield diminishing returns, and so might children. And parity-linked utility would also be different for each of the three types of utility discussed above.²⁵

Finally, it is widely recognized that the perceived values of male and female children respectively are different in many cultures. The returns from male and female children will differ depending on the roles assigned them in the household by tradition. A daughter produces consumption and labour services utilities but those of a son are likely to be greater. These contributions are limited to the girls' early years, since the typical third-world society is patriarchal and patrilineal, and daughters effectively stop being a member of their natal household when they marry. Nor will she make any contribution to the old-age security of her parents. All these elements provide a plausible explanation for 'son-preference' based on an economic understanding of the flow of child-services. In fact, typically the net value of a girl to their natal household may be negative, much as we may deplore the conditions which lead to this outcome. The economic approach has not attempted to deal with such sex-related issues, but is typically focussed on 'number of children' as a single figure.

Allowing for these factors, the demand theory of

children appears to be deficient in not allowing for the distinct possibility, in some circumstances, of low and even net negative returns from children.²⁶

PROBLEM 3: COMPETITION TO CHILD-SERVICES

As has been seen above, children produce a varied flow of services (utilities) to their 'owners'. Becker argues that child-services are special and unique, and this is an important element in his theory for it explains why, in periods of economic and social development, the demand for child-services changes its form – from quantity to quality – but remains an important element in the total resource allocation pattern of the household. The nature of the demand for child-services changes but nothing replaces it. This would seem to follow from the initial rejection of the idea that children could be an inferior good. Is this a valid proposition, either logically or empirically?

Children produce consumption-utility, amusement and leisure-time activity but so can other purchasable assets. Children yield labour-services but these can also be obtained in the wage-labour market. Children can provide income support in old age, and insurance against an uncertain future, but so can land, gold buried in the backyard, or membership of a strong clan or fraternal association. The only real uniqueness of children is that they can, usually, be acquired by couples who are unable to acquire any of these competing assets. Children are 'produced' within the household and may involve little or no out-of-pocket costs. Hence, their cost is low compared with almost any other asset which produces a similar flow of benefits, and this may well make them especially attractive to low-income households with limited options.

But only in the poorest pre-modern economic and social settings do a majority of households find themselves in such a situation. And, when alternative sources of labour, of leisure-time amusement, and of future economic security, are available the demand for child-services becomes a function of the opportunities and prices in these other markets. On purely economic grounds, there is no reason why a well-endowed couple will ever 'need' children to provide any service for them. The increasing prevalence of childlessness in Western and Southern Europe, and even in parts of Southeast Asia suggests that children may, in fact, be viewed as an 'inferior good', once household income is very high, and competing sources of comparable utilities are abundantly available.

PROBLEM 4: CHILDREN AS A RISKY ASSET

Children are clearly an important household asset but the demand theory approach fails to take account of several unique features of children: (1) The acquisition of a child is the ultimate 'no-money-back' purchase. Even if the original estimate of benefits and costs by the parents prove to be wrong, they cannot easily dispose of the 'asset' through re-sale, scrapping, or abandonment as can be done with other assets.²⁷ (2) A child is a living, thinking investment, and no two are alike. The actual flow of children-services will vary considerably from child to child even when all are produced by the same household technology. (3) The child may die before the household receives any benefits, but after resource costs have been incurred by the household.

These considerations suggest that the degree of uncertainty and risk associated with investment in children is greater than other comparable household assets. The existing literature does suggest that households deal with the risk of child mortality and the risk that children may abscond by having a larger number than is absolutely necessary in the hope that some will survive and/or perform their intended role for the parents.²⁸

But such a strategy means that the average cost of the child-services received is increased by the need to acquire several to make certain of the services of at least one. From this it should follow that when more completely reliable market-based competing alternative sources of these services become available, they will be chosen by the household. These considerations also seem very damaging to the assumption that children-services are in any way unique in the household preference pattern.

PROBLEM 5: CONCEPTUALIZING THE SUPPLY OF CHILDREN

The potential number of children available to a couple is usually assumed to be determined largely by biological factors, such as age at menarche, age at menopause, and nutritional and biomedical factors, such as disease, congenital sterility and sub-fecundity. The traditional micro-economic supply curve slopes upwards and to the right from the origin because as more of any product is produced the cost per unit sooner or later begins to rise. This rising unit cost follows from the Law of Diminishing Returns, a questionable but useful assumption which has become nearly an axiom of

micro-economics. But, it is not clear what shape a 'supply of children' curve should take, and this question has been ignored in the literature.

Easterlin's framework presents what it calls 'the supply curve of children' as typically nearly horizontal with perhaps a slight upward slope to allow for the possibility that some biological checks to fertility (caused by disease or malnutrition) are reduced by economic development.²⁹ But this function is drawn with number of children on the vertical axis, and 'level of development' on the horizontal. Cost or price per child do not appear at all, so that this function is not really a supply curve at all.

There is another aspect of the supply of children which has been overlooked. Children are created by biological processes internal to the household. But children can also be acquired by being borrowed, adopted, purchased, or otherwise obtained from biological sources outside a given household. In West Africa 'fostering' is widespread; in pre-revolutionary China 'adoption' was common, particularly to secure a suitable male heir and native American Indian tribes often abducted the children of slain enemies in order to increase their own numbers. In other cultures perfectly open markets have existed in which children were bought and sold. Currently, there is an active international flow in the adoption of 'unwanted' Asian, African and Latin-American babies by European and American couples.

The point is that some sort of 'market' in children does usually exist, and households whose demand for child-services exceeds their own biological capacity to satisfy that demand can frequently obtain them from outside the household. A wealthy household need almost never find itself in a supply-constrained situation with respect to child-services. Any excess demand can be accommodated by excess supply from households which have produced too many children relative to their own demand.³⁰

Can anything be said about the overall supply of children in relation to the demand for them? In describing traditional agricultural societies there has long been the presumption that demand for child-services would be high in all or nearly all households and that an overall supply constraint would typically exist.

In fact, empirical support for this belief is very weak. Most observers of pre-modern societies have commented on the very wide diversity of completed fertility outcomes observed. Pre-modern fertility is not uniformly as high as biology allows. Differences in fecundability explain some of this variability but

a degree of control by some couples always seems to be present. Fertility differentials between groups within populations have always existed, and no large, complex society seems to have experienced sustained overall 'natural fertility', or a situation in which fertility was supply-constrained.

The demand theory of fertility has been silent on this point altogether. What we should say, in all honesty, is that we have no idea how to even begin conceptualizing a supply function of children for the household or for society.

PROBLEM 6: DEFINING THE COSTS OF CHILDREN

Leibenstein has argued that obtaining child-services involves two sorts of cost: (1) the cost in resources required to rear the child to becoming adult (food, clothing, shelter and so on); (2) the time-labour cost of providing child-care.³¹ In most formulations of the economic approach the time-labour cost of child-rearing looms large, and the market wage-rate of women, who are assumed to be the usual care-providers, is taken as a proxy for the cost of children.

According to the theory, what is being produced is child-services, not children as such, and the supply of child-services consists of the number of children times the average productivity per child. Adjusting the number of children is one way of adjusting the flow of children-services to the household, but another is an adjustment in the underlying household child-service production technology.

A moment's reflection leads to the conclusion that 'quality of children' is nothing more than another term used to describe the household production technology for child-services. If consumption of child-services rises with income, even while number of children per household is falling, then the household production technology has been shifted upward. Becker prefers to see this as the household demanding a higher-quality child, but since child-services are, according to the theory, ultimately produced within the household higher quality must imply a superior technology.³² Calling this 'child quality' really adds nothing.

As has been noted above, the most recent definitions of 'quality' have become so broad as to include all expenditures on children including future bequests. The received model tells us nothing about how quality is produced or how the parents decide what quantity will go with what quality to produce the volume of child-services they demand. We know that in the West average family size has fallen

and the average expenditure per child has risen with development, but the belief that this represented a deliberate choice of quality over quantity is an assumption and nothing more.

PROBLEM 7: THE COST OF 'NON-CHILDREN'

The cost of 'children' is related to, but very different from, the notion of the cost of not having children or 'controlling fertility'.

'Cost' is nearly synonymous with 'price' in ordinary economic usage. That is, the price paid in the market by a consumer is the cost of obtaining that item. In competitive markets this price paid by the consumer is equated with the costs incurred by the producer in producing and selling the given item. The underlying economic theory is that the monetized value of the item to the consumer must be at least equal to the price paid, and the price received by the producer must be at least equal to the cost incurred in producing the item. Value to the consumer equals price equals cost of production, the market equilibrium on which so much of micro-economics is built.

What is the benefit to the consumer of controlling fertility? As was argued above, fertility is a by-product of the pursuit of heterosexual pleasure unless some deliberate control is used. Thus, the benefit of controlling fertility is the prevention of an undesired outcome. When the consumer buys contraceptive services, he (or she) is buying a negative service, the prevention of an undesired pregnancy. This makes the demand for contraception, or fertility control, very different from the demand for nearly all other goods and services which produce a positive benefit for the purchaser.

There are other products and services which are useful only to prevent undesired outcomes. These include preventive health measures, such as vaccinations, physical exercise regimes, or long-term pre-attack medication; personal security devices such as burglar alarms, extra car locks or mace for one's pocket; and in a more general sense most types of insurance. At the societal level many environmental protection and anti-pollution programmes are akin to such services. But it is well-known that people are slower to purchase these essentially negative 'prevention' utilities than to purchase a positive utility. It seems that the negative quantity must exceed the price of prevention by a significant factor before the purchase is actually made. This could well help to explain the apparent anomaly that many consumers do not desire more child-services but take no steps to prevent themselves having more children.³³

A second equally important point arises when we attempt to conceptualize the 'price' of fertility control. Most of the economic models of fertility follow Easterlin's framework and simply speak of 'fertility control' as though this were a single product, service, or device the purchase price of which can be ascertained in the market. But, of course, this is not true.

Fertility can be controlled by: (a) regulating access to or frequency of heterosexual intercourse; (b) employing some temporary device to allow intercourse to occur without pregnancy resulting; (c) employing a permanent means of breaking the link between intercourse and pregnancy; (d) ending a pregnancy after it has occurred; (e) disposing of the infant after its birth. The cost of controlling fertility must in the end be related to one or more of the specific methods which the couple feel is available to them. These include: (a) celibate non-marriage and abstinence within marriage; (b) contraception; (c) sterilization; (d) abortion; (e) infanticide and child abandonment.³⁴

There is no literature in which the real cost of most of these methods has been studied, but there does exist a modest literature on the costs of contraception to the user.³⁵ We will take this as indicative at least of the others. Most authors agree that there are three main types of cost involved in adopting and using contraception for the first time: (a) a social cost or the perceived risk of incurring social, familial, or spousal wrath for violating 'correct' (traditional) behavioural norms; (b) a psychic cost, or the personal fears, anxieties and risks about health, and the threat of a loss of sexual pleasure because known methods of contraception are considered to be unacceptable; (c) economic cost or time and money costs required to obtain the services. The first type can be thought of as a societal constraint on making certain choices, while the second is the socio-psychological cost of various methods open to the individual. Only the last category is related to objective market conditions, easily affected by supply.

These different sorts of cost will differ for each of the several methods of controlling fertility which we have listed above, thus complicating the picture even more.

Figure 1 illustrates this argument. On the vertical axis we measure all the several sorts of costs (in terms of disutility) as perceived by the prospective contraceptors, while on the horizontal axis we measure the actual demand for some particular contraceptive services. Curve DD is the demand curve which shows the usual inverse relationship between quantity demanded and price (cost).

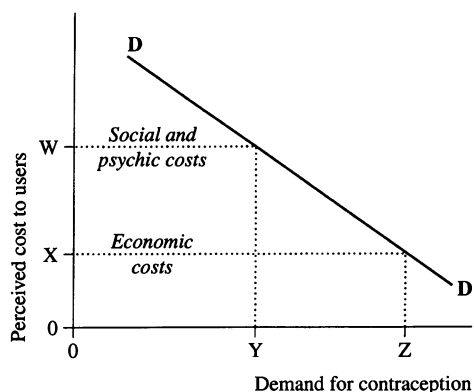


Figure 1.

Looking only at the economic costs (money, time) OX, one would conclude that the demand should be OZ, but allowing for the combined social and psychic costs the real perceived cost by the user is OW, yielding a demand of OY. This relatively low demand for contraception is typically interpreted as indicating a high demand for children. In fact, the utility produced by children may be quite low but a high disutility of obtaining contraceptive services results in children being 'demanded'. Thus, some fertility is 'unwanted'.³⁶

One must conclude that the cost of controlling fertility is a complex many-sided variable unlike almost any other cost, or price faced by consumers. Using distance from, or travel time needed to reach, the nearest family-planning clinic or the out-of-pocket cost of obtaining the service touches on only one aspect of the real costs.³⁷

THE IMPLICATIONS OF THESE PROBLEMS

The points raised above are by no means all the criticisms which can be made of the economic theory of fertility.³⁸ But, the questions raised above do have some important implications for policies and programmes.

First, the conventional economic stresses that high fertility in pre-modern societies is rational, maximizing behaviour because benefits are high, and the resource costs low. To this, must be added that, given the desire for sexual pleasure and that in most third-world settings control over the process of conception, pregnancy and birth is difficult, unreliable, and entails psychological and hedonistic costs, fertility can easily be high, even when an economic benefit-to-cost calculation is only moderately positive or negative.

Secondly, the mainstream economic model of fertility assumes that households always have the option of controlling fertility. The model is demand-

driven and the cost of control (or of contraception) is taken to be minimal. But on closer inspection, these costs turn out to be complex, and until the model deals explicitly with how these costs of control interact with demand we cannot be sure of what we know about the demand for child-services.

Thirdly, the celebrated notion of 'quality of children' turns out to be an empirical 'empty box' and a methodological dead-end. In essence, it states that 'higher-quality' children are preferred, because they provide increased child-services (and utility) per unit than 'lower-quality' children. Producing such high-quality children implies using a higher type of household production technology. Purchases of education and health inputs from outside the household appear to be closely connected with this higher technology which also evidently requires intensive use of parents' time. On both counts the cost per child rises with the higher technology and higher-quality. That is about all the proposition actually tells us. It begs important questions including what factors, internal or external to the household, lead couples to prefer higher-quality children? Are there really choices open to couples, as they see the matter, among technologies for producing child-services? How, if at all, can policy affect these processes?³⁹

Fourthly, the present theory clearly over-emphasizes the unique value of children. When children are the only meaningful source of certain services, they will be 'purchased' by default. But overall economic and social development and growing links of the household to external markets open up new sources of leisure-goods and other services to the household and also provide ways for the household to use its labour resources in other ways than in child-services production. Children also suffer from the inherent disadvantage of being a considerably more risky way of obtaining a future flow of certain household services than many other potential sources. At low levels of development, children may be chosen simply because of the absence of such other choices. At high levels of development, children may yet turn out to be 'inferior goods'.

In summary, these considerations imply that the demand-oriented theory of fertility has led us up the theoretical and empirical blind alley foreseen by Leibenstein twenty years ago.⁴⁰ Properly understood, human activity which produces children is frequently not undertaken in a rational effort to produce children at all. Children may be born simply because it is too costly for parents to avoid them. And a large part of this 'cost' consists of non-economic socio-psychological elements.

Similarly, children are one way of using household time and energy so as to obtain useful services, but one which is highly limited and of uncertain outcome, and hence likely to be replaced as soon as other options become available. These other options depend upon factors external to the household, chiefly the emergence of new markets, new products, and new technologies and are what we call economic and social 'development'. This process also involves changing ideas and values, or what some have suggested calling 'ideational change', which reduces the subjective socio-psychological cost of controlling fertility.⁴¹

This interpretation of the economic model suggests conclusions about policy-programme interventions very different from the essentially negative ones of the conventional economic model, which says, in effect, that since actual fertility is demand-driven 'whatever is right' and policy-programmes can do little to change outcomes.⁴²

Even accepting that overall socio-economic development is probably the strongest force leading to lower fertility – by increasing the cost of household labour, creating alternative sources of utility which compete with children, and causing a more materially-oriented value system – our view nevertheless suggests that a well-managed public sector contraceptive information and supply programme can also lead to decreasing fertility by accelerating ideational change and lowering the cost of controlling fertility. There is growing evidence that 'ideational' change needed for the socio-psychological cost of fertility control to fall can occur with even modest overall social and economic development. In several countries in which measures of economic development have not increased, fertility has fallen when effective contraceptive supply programmes have been put in place.⁴³ This suggests a latent pre-existing demand for fertility control which the programmes were able to trigger. The speed with which society and households learn to control fertility may be at least as important as the factors which affect the demand for child-services. And the former is a much easier point for policy intervention.

CONCLUSIONS

None of the above considerations is intended to argue that economic paradigms and concepts are not helpful in understanding the fertility-decision process. We feel an economic approach is, in fact, helpful. But, the dominant economic model seems bogged down in a simplistic demand-oriented framework, with the unnecessary and confusing

'quality of children' notion clouding everyone's thinking. If it is to provide valid insights into human behaviour and guidance to policy, the economic theory of fertility must be substantially reformulated. The key concepts of perceived value and household production costs must be given real empirical content. The cost of avoiding children must be seriously considered and no longer taken to be a simple uni-dimensional variable, easily captured by a single, rough proxy.

In short, what is needed is greater conceptual clarity in the theoretical framework, and more precision in specification, such that actual measurement of such basic variables as demand, supply and cost can reasonably be attempted. There now exists proven capacity to design and apply survey instruments capable of capturing almost any socio-economic process or activity once it is clearly identified. With sharply-defined, empirically-focused variables and appropriate data sets, the underlying relationships can almost certainly be established.⁴⁴ The economic theory of fertility has not opened the door to a full understanding of the fertility-decision process but it may yet do so.

NOTES

The author is Professor Emeritus, the Pennsylvania State University, and Senior Associate, Economic Research Associates, Washington, D.C., USA. He received helpful comments from Joel Darmstadter, Sarah Harbison, David Horlacher, Julian Simon, and referees of this journal. No one but the author, however, bears any responsibility for the content of the paper.

¹ The classic references are: Leibenstein 1957 and Becker 1960. Both authors developed and refined their approaches in papers and books too numerous to mention. We shall refer to many of these in the pages that follow. Good recent surveys include: Willis 1987 and Olsen 1994. Two excellent books have also recently been published: Cigno 1994 and Razin and Sadka 1995. Both neatly summarize Becker's approach and make important clarifications and additions in their own right. Following earlier writers, Olsen suggests that there are two 'schools' in the economics of fertility: the 'Chicago School' represented by Becker, Willis, Rosenzweig, Schultz, Nerlove and others, all of whom accept Becker's fundamental assumptions and approach; and the 'Pennsylvania School', comprising Easterlin, Wachter, and others, who prefer a more eclectic model. This, to my mind, is gravely misleading. There are, indeed, two schools, but they are 'Becker/Chicago' and 'Everyone Else'. The second 'school' would better be called the 'Socio-economic School' since it rejects a narrowly economic approach, and employs more diverse variables and methods. Leibenstein's work pioneered this tack and predates the discovery of the economics of fertility at either Chicago or Pennsylvania. This approach is exemplified by Leibenstein 1975a. See also Easterlin 1969 and, more recently, Pollak and Watkins 1993.

² Willis (1987) states, without artificial humility: 'There is no alternative theory of demographic behaviour that comes close in terms of either scope or power'.

³ The leading demographers of the 1950s were aware of the near-absence of theory in their work. (See Hauser and Duncan 1959, especially Chapter 3 'Demography as a body of knowledge'.) Davis (1959) argued that this atheoretical bias of

demography was deliberate and correct. 'It is difficult to avoid the conclusion that the major advances in the science of population have come from improvements in the sources of information and in the techniques of analysis rather than from broad interpretations... Perhaps the critics are right who say that demographers have neglected theory. If they mean by theory what it has meant up to now, the burden of proof is on the critics' (pp. 313-314).

⁴ An attempt has been made to sketch out at somewhat greater length the reasons for this triumph of the economic model. See: Robinson and Cleland 1992.

⁵ Easterlin 1975. The original model was later developed at length in Easterlin and Crimmins 1986. The most recent version is presented in Easterlin *et al.*, 1988. Montgomery (1987, p. 431) states: 'The [economic] synthesis is at once simple and attractive. It provides an integrated explanation for contraception and cumulative fertility over a reproductive lifetime, taking important constraints on childbearing into account.' Many others obviously agreed with these judgements.

⁶ T. P. Schultz, for example, has argued that the real value of the theory is for an '... investigation of the various policies ... that may affect decisions of parents. For example, do subsidized birth control information, services and supplies reduce... the reproductive performance of couples... [and] are more accessible schools an effective measure... for reducing fertility?' See Schultz 1980, pp. 3-4. Willis's recent survey (Willis 1987, p. 68) continues to see 'policy questions' as a major goal of the economic demographers, while Becker's Nobel Prize address stresses, even more than in his early work, the importance of 'social questions'. See Becker 1993.

⁷ Chapter 1, by the editors, is a good summary of the demand-supply economic approach followed. See also the accompanying volume which deals with applications to family planning programmes: Lapham and Simmons 1987.

⁸ Willis (1987, p. 78) states with frankness but no evident concern: '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... is not likely to be remedied soon.' Both the World Fertility Survey and the more recent Demographic Health Surveys reach very cautious, modest conclusions about causes, and pose as many questions as they answer. See: Cleland and Scott 1987. Also: Mururi *et al.*, 1994.

⁹ A lively debate continues over whether family planning programmes have any real effect upon fertility, and the underlying economic model seems to provide contradictory guidance. See: Pritchard 1994, and the comments on this article in subsequent issues of that journal. This uncertainty permeates the recent policy-related literature. See National Research Council 1986; Berhman 1994; Cassen *et al.*, 1994; World Bank 1984, Box 5.1, p. 80.

¹⁰ Leibenstein 1957, p. 460.

¹¹ Becker has developed his theory in numerous articles and books since 1960, many of which are referenced later in this paper in connection with particular points of that model.

¹² See Lancaster 1996; Muth 1966. A good critique of the approach is in Pollak and Wachter 1975.

¹³ See Blake 1968.

¹⁴ Becker 1991, p. 135.

¹⁵ The notion of 'child quality' is key to Becker's entire theory. The original statement was in Becker and Lewis 1973. See also Becker and Tomes 1976. He has repeatedly returned to the point. See, for example: Becker 1991 in which (p. 140) he writes: 'I believe... the interaction between quantity and quality of children is the most important reason why the effective price of children rises with income.' The interaction follows from his formulation of the term denoting expenditures on children (child-services) as $P_c \times q \times n$, in which P_c is the cost per unit of quality, q is quality per child and n the number of children. Becker has modified his basic model by adding parental 'altruism' and 'dynastic' considerations as sources of utility for the couple contemplating their family size. See: Becker and

Barro 1988. This modification has no bearing on any of the points about the basic model raised in this paper.

¹⁶ Thus, Becker (1991, p. 140) writes: 'Indeed, I believe the growth of the earning power of women during the last hundred years in developed countries is a major cause of... the large decline in fertility.' For a discussion of this question of the time-intensity of children in relation to 'quality', see Robinson 1987.

¹⁷ Some years ago Arthur (1982) complained about this formulation, which assigned a key role to changes in the price of quality when quality itself is taken as an expenditure. 'How can expenditures have a price?' he asked. Becker has replied that they have a 'shadow price'.

¹⁸ Olsen (1994, p. 75) only notes the existence of: '...latent prices for "goods" that resist measurement, such as "child quality"'.
¹⁹ Razin and Sadka (1995, pp. 6, 13).

²⁰ Cigno 1994, p. 86. Cigno and Razin and Sadka also show how notions of 'altruism' are incorporated in this model.

²¹ A recent restatement of the course of the European and other fertility declines is: Caldwell 1994.

²² As late as the early 1980s, some 30 per cent of the births in the U.S. were unplanned in spite of contraceptive prevalence being over 60 per cent. See: Westoff 1987.

²³ Obviously, writers have been aware of the 'jointness of demand' issue since the days of Malthus. Easterlin (1969) explicitly discusses this point in an early statement of his own economic framework. Michael (1973) referred to the 'commodity' of sexual gratification at an early Chicago meeting, and made an effort to introduce this factor as a term in the utility function. A bit later on, Cochrane (1975, p. 373) made the interesting point that: 'If children are seen as purely a zero-utility by-product of sexual activity, the cost of engaging in such activity is the reduction in the standard of living caused by the support of the resulting children.' These promising early leads have simply not been followed up in the recent literature and the mainstream model ignores the point.

²⁴ Leibenstein 1957.

²⁵ Leibenstein has always advocated viewing the fertility decision as a marginal, sequential process and one in which household perceptions of both child costs and benefits were structured by socio-economic class considerations. See: Leibenstein 1975a, b.

²⁶ Caldwell's (1982) theory of intergenerational wealth flows and their reversal would appear to be a sociological statement of how such situations emerge and lead to fertility decline.

²⁷ Deaton and Muelbauer (1980, p. 208) put it very well: 'Children are not chattels that can be readily sold or otherwise disposed of'.

²⁸ Cain (1983) has argued that having many children is a 'risk-averse' strategy for poor third-world families and their hedge against an uncertain future. This may well be true in those situations in which absolutely no other institutions or devices are available to avoid or hedge risk. But such situations are rare even in poor rural third-world countries. M. Rosenzweig (1988) has shown that such familiar rural institutions as share tenancy, implicit permanent service labour contracts, and client-patron arrangements are all ways of reducing risk for poor households. Such arrangements are probably linked to the fertility decision but, as Rosenzweig stresses, the link is a complex one and has not been explored.

²⁹ Easterlin 1975.

³⁰ Harbison (1983) presents one of the few efforts in the literature to explore this point. On the growing market in adoptions, see: Zelizer 1995. See also: Landes and Posner 1978 who argue for the legalization of a free market in adoptions.

³¹ Leibenstein 1957.

³² 'Household production technology' is also a 'latent variable' but it does not lend itself to measurement. Hence, expenditures on child quality can be taken as the cost of acquiring the necessary inputs for the technology required to produce the desired quality.

³³ The problem of how to evaluate individuals' willingness to pay in order to avoid a negative consequence is a major

unsolved economic issue affecting public programmes for the environment, health, safety, and regulation in general. One technique developed for measuring the value of such activities is called 'contingent valuation'. See: Mitchell and Caron 1989. I am unaware of any attempt to adapt this technique to fertility analysis, but it would seem promising.

³⁴ These typologies are presented in more elaborate form elsewhere. See: Bongaarts and Potter 1983; Davis and Blake 1956.

³⁵ The best collection of papers dealing with this issue of the non-economic as well as the economic costs of contraception are those in Volume II of the National Academy study edited by Bulatao and Lee (1983). In particular, see the papers by D. Bogue, 'Normative and psychic costs of contraception'; A. Hermalin, 'Fertility regulation and its costs: a critical essay'; and S. B. Scherer, 'Monetary and health costs of contraception'. These papers have not received the attention they deserve. The present treatment of these issues is really nothing more than an effort to apply the work of these earlier authors.

³⁶ Bumpass (1987) has called attention to the rise in sterilization as the preferred contraceptive method when couples strongly desire to avoid unwanted births. The notion of 'unwanted fertility' in relation to the supply-demand framework is dealt with more systematically in a recent paper by Bongaarts (1992). I am indebted to Dr Dale Huntington for calling this paper to my attention.

³⁷ The relative complexity of this cost of fertility control variable is explored in Robinson and Cleland 1992. A discussion of the inadequacies of 'proximity' as a surrogate for price will be found in: Tsui and Ochoa 1992. Looking only at the out-of-pocket monetary costs of contraception has misled many authors including most recently Pritchard (1994, p. 25) who concludes: '...that the demand for children would be very inelastic or unresponsive with respect to contraceptive costs'.

³⁸ The present paper cannot treat all possible criticisms of the basic economic approach. For example, we ignore the manifold difficulties which arise if one allows for differences in perceptions by husband and wife of either costs or benefits. [For a discussion of these issues see: Pollak 1985; Mauser and Brown 1979; and, more recently: Folbre, 1994.] Becker and most Chicago-school economists assume the decision-maker's goal is the maximization of a single inter-generational household utility function which maximizes the aggregate well-being for all members.

³⁹ Leibenstein, as noted, has argued that different socio-economic groups have different perceptions of costs and benefits and that tastes and preferences change as does income. See the 1975 articles in the *Journal of Economic Literature* and *The Quarterly Journal of Economics* cited earlier.

⁴⁰ Leibenstein 1975b. Nambodiri's early criticisms of the then-emerging economic model also seem remarkably prescient. See: Nambodiri 1972.

⁴¹ On the role of ideational change, see: Cleland and Wilson 1987.

⁴² For representative examples of this extreme market-based argument against the effectiveness of family planning programmes, see: Pritchard 1994; Demeny 1988.

⁴³ Birdsall 1994. Also: Freedman and Freedman 1992 and Phillips and Ross 1992.

⁴⁴ Going back almost to the first statements of the economic model of fertility, prescient authors have cautioned against 'allowing econometric convenience to dictate the nature of our theories' and have stressed that 'the economic theory of fertility is too important to rely on second-hand data, devised for other purposes'. (See the citations for these quotations in Leibenstein 1975b). Clearly these warnings were ignored.

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