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Benefit Cost Approaches to Family Planning Programmes: A Review

I. INTRODUCTION

Since the Middle Ages, R.H. Tawney's 'Acquisitive Society' has gone on happily amassing man's worldly goods until it felt seriously threatened by a population explosion in the developed as well as the underdeveloped world. Although the world today has a population growing more rapidly than ever before, the potential for economic growth is much higher today than the potential for population growth. The crux of the matter is not whether the world can adjust to the present high rates of population growth but how much better the prospects all round would be if these high rates could be reduced. Such a dilemma may well lead to a seemingly insurmountable problem of placing a value on human life and attract George C. Zaidan's exasperated question, 'Is life worth nothing or is nothing worth life?'[1]

Benefit cost analyses of family planning programmes are essentially attempts to weigh the welfare of the unborn against that of the already born. Even while agreeing in part with Harvey Leibenstein[2] when he derides at least two types of gadgetry — the gadgetry of birth control devices, and the intellectual gadgetry of the benefit cost analysis — most people can not ignore the need for measures which will garner the fruits of man's labour against improvident increase of population, particularly, when three-fourths of the world's popula tion still live below the poverty level of the western world, and when the means of material well being at their disposal are not plentiful. No one, it may be argued, knows the appro priate substitutability between children and consumer goods, but the value of consumption goods is much too real to be ignored. Benefit cost analysis approaches are therefore very relevant.

There are three main paths through which fertility decline affects the rate of growth of per capita income.[3] The first leads to a smaller population which leaves the national income, certainly not reduced but possibly increased in the short run, to be shared by fewer persons. Declining fertility does not by itself impair the productive capacity of the economy as determined by the amount of natural resources, the accumulation of capital, the quantity and quality of labour force and technology. Fertility decline should not ordinarily have any

effect on any of these factors, except the accumulation of capital and the size of the labour force. The first effect is positive and immediate in the sense that the savings potential of an economy increases with fertility decline. The second is negative but occurs with a time lag of 15 years or so, and is likely to be compensated over time by such factors as greater efficiency, education and improved technology. It is with respect to the first effect that the benefit cost criterion is relevant. The total benefits of a family planning programme depend very much upon the absolute population and on how many births are averted, on the value of n (absolute numbers) rather than x (the rate of growth).

. The second path leads to the accumulation of capital through greater savings on account of fewer children. The lighter burden of dependency opens up possibilities of private and public savings. It is however another matter whether parents will in fact increase their savings or whether they will consume their increased income ; whether governments will put their public savings into government consumption or government savings.

The third path, that is through a reduction in the rate of growth of labour force, wilt lead to two effects : short run and long run. The short run effect has already been described. The long run effect may ultimately be negative; although, in conditions of surplus labour such a reduction will not affect the national income of an economy, at least initially.

The basic tenet of benefit cost analyses in simple and, to a point, irresistible. It affirms the worth of jam today ; a hundred dollars today is worth more to a person than a hundred dollars next year. 'Given a free choice, with all other factors equal, a person will always prefer income (or goods) *now* to income (or goods) tomorrow. Further income must consequently be reduced (or discounted) when being compared to present income. The prevailing market rate of interest is a measure of the annual rate of return on savings (or non-consumption of current income). This rate of return induces people to save some of their current income (to postpone their consumption of it for one year). The interest rate is then a measure of the inferiority of future goods in relation to present goods and can be used as the rate by which future income (or benefits) is reduced to convert it into present value'.[4]

It is the present value of the discounted consumption stream of an unborn child that is the measure of the benefit accruing to society from the prevention of a birth. This benefit is then related to the current cost of family planning services of preventing a birth. But such an exercise inevitably depends upon its assumptions, which, as Zaidan says, may well lead to 'implausible conclusions'.[6] For, on the basic assumption of this kind of economic analysis, *i.e.* consumption now is always preferred to consumption in the future, the benefit cost criterion is valid not only for the n'th child but for even the first. This may well drive one to recognise the *reductio ad absurdum* as the ideal situation, when there will be no human being left to enjoy all the marvellous goods he will have produced : the quintessence, in short, of the approach of maximising per capita income which is the heart of the benefit cost exercise.

II. MEASURING THE ECONOMIC BENEFIT OF FERTILITYR EDUCTION

Benefit cost analyses are addressed primarily to governmental benefits and government costs, and not to personal benefits and personal costs. The governmental goal of fertility reduction

and the personal goal of small family norm may traverse different paths ; and the twain may not always meet on the trajectory. Bat since the message of the analytical quest is increase in per capita income, and the costs are assumed to be costs borne by society, the universe of investment, growth and public savings are automatically attracted.

The Macro Investment Model Approach

Dublin and Lotka, in their The Money Value of a Man' published in the 1920's, might claim to have launched this approach from the moorings of Marshallian economics. In recent years, Enke has been its chief exponent. The Enke Effect, if one may call it so. emphasises the primary effect of birth reduction on per capita income. The heart of the Enke Effect is expressed by the formula[6]

$$\sum_{t} \frac{B_t - C_t}{(1 + r)_t} - P \geq 0$$

where P is the cost of preventing a birth through family planning programme; Bt is the benefit derived from a prevented birth for year t, *i.e.* it refers to the age *of* the person if the birth had not been prevented or the consumption saved in year t by having prevented the birth ; Ct is the contribution to output that is foregone by the fact that the birth had been prevented during year t ; and r, the rate of discount.

This formula can be conveniently separated into three segments as follows (i) ages-12 or -14, (ii) 13-60 or 15-60, or 15-65, and (iii) 60 or 65 and over. In the first segment there are only economic benefits from a prevented birth since a person does not work before age 12 or 14 ; hence, there is no output foregone. The second segment includes both benefits, and costs during the working years of the individual. The third segment once again includes only benefits accruing, from a birth prevented now, after 60 or 65 years. If, in the second segment, the person produces less than he consumes, then there must be a positive benefit from the prevention. The Enke Effect also argues that in densely populated underdeveloped countries the marginal' produce of labour is close to zero, which means that since the costs which represent the production foregone *(i.e.* marginal product of labour) by a prevented birth are less than the benefits *(i.e.* the consumption saved which is roughly equal to output per worker), the end result must be that th; benefits are considerably greater than the costs. This will be accentuated by a discounting procedure, since the benefits start immediately but costs occur 13 years later and are, in consequence, discounted in comparison to the benefits to a greater extent and have a lower present value. Refinements to this basic presentation, byway of assumption of mortality and unemployment rates at various ages, would only increase the benefit cost ratio. Leibenstein depicts 'the basic logic of these arguments' in the graph (figure 1) in which both consumption per 'worker' and production foregone are indicated on the same logarithmic scale.

The graph shows clearly that 'the present value of the benefits of consumption saved per labour unit will be greater than the production foregone'. Enke's costs include the productive contribution to the economy that an additional person would have made through his life time, and the real costs of providing family planning services.

Whichever way one looks at it, despite all the criticism that Zaidan and Leibenstein have to offer, the fact remains that the benefit cost ratio for a public family planning pro-

gramme is high on any reckoning. Even if one dismisses Enke's claim as 100:1 out of hand, Zaidan himself has estimated this ratio to range between 2.5:1 to 8.1:1 for UAR. For India, Robert Repetto's estimate is 5:1, George Simmon's 40.5:1, and R. N. Basu's, 32:1. A simplified calculation by Ramesh Mehta, based on current costs and current benefits in India, gives a benefit cost ratio of 16 : 1. President Johnson made a global claim of 20:1 at the United Nations 20th Anniversary Commemorative Session at San Francisco in June, 1965.[7]

Presented in this form, no government activity will have the ghost of a chance beside the one and only one programme for any economy, *viz.* family planning. K. C. Seal in a paper presented recently (February 16-17, 1972) at a Seminar of Demographers in Delhi made a variant claim that 'In general, for rapid growth of per capita income in an overpopulated country, population control projects should get priority over any capital investment project for which the incremental capital output ratio (ICOR) is greater than the ratio of cost of preventing the birth to the per capita income aimed at in the economic development programme'.[8] But few governments or even private enterprises base their decisions on ICORs alone. Yet, Seal's thesis when considered against optimal notions of a population yields a criterion for decision making. Enke's benefit cost ratio presentation, too, needs to be examined in respect of its assumptions and limitations.

It is pertinent to argue whether in the field of population the practice of discounting the future makes eminent sense. For the rate of discount in this field, from around -10 per cent in banking economies to anything like a usurious 50 per cent or more in various agrarian economies, will put every other investment prospect out of court. And if, further, the internal rate of return technique is preferred, the results will be even more decisive. The discounting procedure, however, is valid for marginal changes in the birth rate, feasible over a ten to fifteen year period. It is particularly valid for underdeveloped countries where quality, as distinct from quantity, is a crucial test of development, where quality can be identified with per capita income and where a large proportion of children born are essentially not wanted by their families. But, all the same, it probably is more behaviourally acceptable to take time streams of benefits and costs, or of the difference between benefits and costs, without resort to discounting at any one fixed rate. Perhaps the answer lies in trying several graded discount rates. This will still enable the policy maker to compare this with the time streams of investments in alternative economic sectors where the policy maker, presumably more of a behaviourist than the economist, will choose his own weights for different time periods.

Several conclusions follow from the Enke presentation which have been variously elaborated As a result of the social gains due to the primary effect of birth reduction on per capita income (Enke), a crop of secondary effects will follow population limitation. The first of the secondary effects which may be called the Leibenstein Effect, after its author, will be a rise in productivity per worker, thanks to increased per capita caloric intake along with the rise of per capita income. The second of the secondary effects which may be called the Demeny Effect, after its author, would be an increase in household savings to the extent that private saving's are a function of per capita income. Demeny would allocate this increase in household savings under normal conditions to an increase in investment, but Zaidan disputes this automatic or 'normal' relationship.[9] The third fall-out effect will be a decrease in public investments in human capital such as public health or education reflecting fertility decline. This may be called, after its authors, the Coale-Hoover Effect.

These investment models, being essentially exercises in partial equilibrium analysis, attract Gunnar Myrdal's general criticism of being 'mechanical' rather than 'behaviourist'.[10] But it is important to take a brief look at their assumptions, and also limitations, if only because the benefit cost approach will show large economic benefits under most conceivable conditions.

To start with, the idea of a society reaching an economic optimum through the process of becoming extinct does not make even economic sense. By the same token, the benefit cost approach leads to the conclusion that a reduction in fertility would be desirable on economic grounds for all countries at all periods in their history, and more so for the most advanced countries with the most advanced technologies of production,

The benefit cost approach implicity assumes that (a) per capita income is the criterion that looms overwhelmingly in it; (b) this welfare refers only to people living today and does not take into account the welfare of the unborn; (c) children do not give any form of satisfaction or impose any costs other than those included in the benefit cost approach.[11]

These assumptions have only to be spelt out to show the limitations of the welfare-function of the approach, First, the approach is good not only for the nth child but even the first child, which does not make too much sense. Second, it implicitly assumes that consumption is the main purpose of economic behaviour and even Gary Becker would not know the appropriate substitutability between children and consumption goods. Third, the approach assumes that the prevented birth is of a person who, if born, would be a marginal worker. It is one of the embarrassments of a family planning programme that the incidence falls more on those of middle class origin who do not become marginal workers, rather than on those of working class or peasant origin who might become marginal workers. Fourth, the approch minimises the rate of residual inputs such as education, technical change, entrepreneurial activities, as well as other non-standard inputs which are not well understood. I shall return to it later. These are now reckoned as more important than the standard inputs of capital and labour Fifth, the costs of achieving a prevented birth are often understated. Besides, there may be little relationship between the cost of acceptance of contraception and the cost of a net birth prevented, the degree of substitution taking place being not quite known. Sixth, there are problems of allocation for consumption by children born and not all of it can as a matter of course be put down as social costs. Seventh, the benefit cost formula does not take into account the value of alternative policies which may alter the incentives to have children and which may result in a reduction in family size, e.g. some of the indirect benefits of increasing women's education/or their employment in non-agricultural pursuits or of increasing the age of marriage.Finally, a family planning programme may well result in subsidizing the middle class by taxing the poor, and it is not unlikely to have adverse effects on income distribution by conferring a greater benefit on the more responsive but non-marginal middle class than on the relatively unresponsive but marginal agricultural labourer[12]. Leibenstein sums up the position as follows: "We cannot calculate a meaningful benefit cost ratio until (1) we have a satisfactory set of social welfare criteria for birth prevention; (2) we know the behavioural elements that determine the incidence and total effects of the family planning programme envisaged; (3) the nature of the cost functions of birth control activities; (4) until we know the behavioural forces that determine the degree 'of substitution between the induced or subsidized means of family planning as against

alternative population controls; and (5) unless we do it from a macro economic viewpoint which takes as many interdependencies as possible into account".

The Discounted Consumption and Production Streams of an Unborn Child

With regard to the undeveloped economies, the benefit cost discussions usually refer to the agricultural workers who form around 70 per cent of the labour force. There are few estimates of the marginal product for industry or for the service sector. It is however generally held that productivity in industry usually rules well above that in agriculture. Wages in industry are usually several times as high as in agriculture, but it is difficult to allocate the excess to (a) higher productivity, (b) wage legislation, (c) trade union pressure, or (d) the higher cost of living in urban areas. In the service sector, it is possible that the marginal product is not far from zero; but then why would people hire services in urban areas, even as landowners continue to hire labour at positive wages, if the marginal product of labour should be so close to zero? It is thus too facile to assume that the magnitude of the productivity of labour in the industrial and service sectors would correspond to the marginal product in agriculture or that the 'national' productivity of labour would therefore be equal to the one prevailing in agriculture.[14]

The Growth Model Approch

Broadly, two types of growth models are usually employed with population as a variable. The first is the Harrod-Domar model which assumes a constant capital output ratio in the period under analysis even thought it may be subject to change over time as a result of technological progress. Such models assume that the only way to increase output per capita is to increase the capital stock per capita. The marginal productivity of labour is implicitly set at zero.

The classic study, published in 1958, but in pre-publication circulation since 1956, by Coale and Hoover (C & H) of Indian economic and demographic trends, stemmed from the Harrod-Domar model. C & H constructed an econometric model of Indian economic growth in which the size of population and its rate of growth were introduced as explicit variables. Its purpose was to measure quantitatively 'the economic significance of a reduction in fertility'. A secondary purpose of the study was to test the sensitivity of the model to various alternative assumptions about the non-demographic variables. In the essence, the model is a linear difference equation:

$$Y_{t+2.5} = Y_t + \frac{2.5\ G}{R}$$

where Y is real national income, G is equivalent growth outlays which is a measure of total investment adjusted for varying degrees of productivity and gestation periods of its components; and R is capital output ratio. (C & H did not treat R as a constant but rather assumed that it grows over time so that it is equal to an initial value, *m,* plus an annual incremental change, *n.* R=m+nt.)

The effect of this exercise was to show that the rate of growth of per capita income decelerates under high rates of population growth and accelerates under low rates. But this

model did not build in costs of a fertility reduction programme, which Demeuy provided by extending the C & H model. Enke brought in further refinements.

The second type of growth models where the purpose is to forecast the effect of changes in demographic variables over a period of decades, is based on the Cobb-Douglas production function. In these models, the marginal productivity of labour need not be zero, and the savings function is not crucial as a lever by which population affects growth. Several models have been based on the Cobb-Dougles function, the chief being (he one prepared by Peter Newman and R.H. Alien and the one, by Stephen Enke.[13] In both the models population reduction depends upon whether the increase in capital offsets the effect of reduced labour input.

Recent Studies of Savings in Health, Education Expenditure, etc.

Savings in health, education expenditures, etc. of a prevented birth forms the core of C & H's construction of G, or 'equivalent growth outlays' which is an extremely elegant though complex affair. It can be expressed by the equation,

$$G=Ic+(e_cI_{we}+e_iI_{wi})L+(e_cWc+eiWi)t_{15}(l—L)t_{l5}$$

Ic is investment in growth promoting capital goods, I_{Wc} refers to welfare outlays attributed to the needs of the current population and I_{wi} to welfare outlays attributed to the needs of the current addition to population, e's represent a set of linear weights, and L, labour force participation rate. The model was designed to produce estimates of I_{wc} and I_{wi}. This was done in a sub-system of five simultaneous equations.[16]

Although much work in the last two decades has been done to estimate the effect of health, education and other sectors in the building up of capital stock through human resources, these sectors are still largely looked upon as consumption and welfare, and the savings on them by a birth prevented is regarded as savings for investment instead of possible depletion from the ultimate capital stock. C & H in their book have measured these savings at length, the methodology of which has been briefly noted above. Similar but extended exercises have been done, among others, by Erike, Demeny, Gavin W. Jones, and Julian L. Simon.[17] Zaidan in his IBRD monograph has attempted a table of 'Benefits from Reduced Government Expenditures on Primary Education' which is of methodological interest in its application of stated rates of return on amounts of incomas that are generated, if these savings are invested and the present value discounted at 10 and 15 per cent. Zaidan's point is valid that while a reduction in the present birth rate will reduce expenditure on primary education which can be invested rather than consumed, the effect of lower birth rate on secondary education will see little change, as secondary education aims to educate either a given absolute number of children or alternatively a constant percentage of the relevant age groups. This may well result in a higher proportion of children receiving secondary education, thereby improving the quality of the labour force. If, however, the object were to keep the percentage of children receiving secondary education constant to the total population, then resources released from secondary education would also be available for investment.[18]

The behaviour of private savings would be less predictable, for it would be unwise to assume that fertility reduction would automatically raise private savings. Private savings will vary from country to country, depending not only on the premium put on consumption-orientation but also the tax patterns etc. The demands of a population for higher living standards may accentuate consumption and it will not do to forget that the staple of mass campaigns in family planning programmes is the lure of more consumption.

The Micro Level

The micro level approach has so dominated economic thought on the problems of under-developed countries that a plausible economic theory of family formation for the underdeveloped world has not had much of a chance. A crop of literature has lately grown up which took upon itself the task of incorporating the possible compulsions of family formation in the western world, the chief landmarks of which are Harvey Leibenstein, Gary Becker, Jacob Mincer, Deborah Freedman, Ronald Freedman and Lolagene Coombs, Judith Blake and Goran Ohlin.[19] A similar effort remains to b; attempted for predominantly agrarian economies, where the conventional economic theory of consumer behaviour with children as a special kind of'goods' (imputing more value on consumer satisfaction than on investment) still holds away. The universe of discourse of the authors mentioned above is so conditioned by a tradition of government supported social security, free education and health services, trade union safeguards, old age pensions and price support policies that the benefits of children as a deliberate economic investment hardly figure in it. Ohlin's observation that 'investment in children is a costly way of securing old-age support' is the kind of opinion which presupposes that other alternatives are open to the family in good measure, which is just not correct for trust underdeveloped countries. It should *be* plain to any economist studying, for example, India, that children are in every family regarded primarily as investment and saving against old age rather than a consumer satisfaction. This is at the root of the dichotomy that confronts a social scientist in the underdeveloped world : the dichotomy between population reduction as a national goal and family planning as a personal goal. Even the meanest peasant has no difficulty in wishing to have a very small family (the small family norm of 2 or 3 children is no longer in doubt as a universal desire) ; in saying this he articulates, and identifies himself with, the macro-economist's aim of raising per capita income through fertility reduction. At the sama time, he finds it difficult to wish for less than two sons and a daughter, and possibly a third son as insurancs against premature death of any or both of the first two, as a positive measure to conduct his family enterprise and improve his capital stock, and also as investment and saving for old age for which he does not mind paying a premium now rather than gain the discount on prevented births.

In a public family planning programme such a situation presents problems of additionally discounting the cost of unwanted daughters or surplus sons born. In an underdeveloped country, it is the peasant's urge to pay a premium on a birth now and thereby mortgage the present for the future that is more important than his urge to maximise the present by discounting the future. It is the urge for jam tomorrow rather than jam today (the heart of the western macro models which incorporate rate of change of human fertility as a variable) that is the reality that awaits to be investigated in terms of a plausible economic theory of family formation to resolve the dichotomy of national and private goals in family planning

programmes of the underdeveloped world. Viewed in this light, the formula reproduced in paragraph 9 above may be recast in some manner as follows :

$$\sum_t \frac{W_t(B_t - C_t)}{(1 + r)_t} - P \geq 0$$

where Wt represents the weight perceived by the couple for benefits accruing at stated ages for themselves and takes care of the sex of the child and the percentage of cost that might be saved and invested for the future.

Harvey Leibenstein classified mainly three types of utility that a birth might generate for parents: (1) as a consumption good, *i.e.* as a source of personal pleasure ; (2) as a production agent contributing at a point of time to the family income ; (3) as a potential source of security in old age[2]". Gary Becker developed this notion by arguing that people decide on the number of children they will have in much the same way as they purchase a consumer durable. Bscker concludes that the reason for high fertility among low income groups "may be in their lack of knowledge of contraception, which appears to be an oversimplification, Becker, and after him, Judith Blake and others developed the assumption that fertility and income are positively related.

This is the heart of the matter, which conflicts starkly with post-1946 experience in socialist countries, Japan and ths developing world, that fertility and income are negatively related in the middle of a growth process, which is also the heart of all the family planning campaigns in the underdeveloped world. Obviously the answer lies in evolving a micro -conomic theory of family formation in the underdeveloped world that will establish an equilibrium between decreasing the size of one's family, on the one hand, and increasing, on the other more directly the command over material goods, non-human capital stock and services of the existing members of the family. Surveys on awareness of the small family norm establish the fact that most family units now would like to make their own cost to benefit calculation, just as they do in the work-leisure decision or in buying more of x and less of y.

Costs to Parents Having Children[21]

Financial costs cover the actual costs of acquiring and maintaining a child, that is, costs of pre-natal care and delivery ; recurring costs on food, clothing, shelter and medical care; and educational costs until the child is grown. These are perceived by an illitrate peasant professing allegiance to the small family norm as a time stream which can be reduced to a present value by appropriately discounting the future costs. He harbours some notion of present value which would equal the stream of future outlays, but it is possible that this notion is blurred because in peasant societies, (1) pre-natal care is rare; (2) medical and educational costs are low and often optional ; (3) food, shelter and clothing do not always involve out of pocket costs. It is usual for peasant households to argue that financial costs of a child are marginal and close to zero. There is still another consideration. Marriage at younger ages among low income groups, more than among high income ones, increase the feasibility and probability of spreading overhead expenses on subsequent births in low income families. The situation is sharply different in the developed world where families have to

spend sometimes even more on a child on these counts than on an adult. These costs are positive and put the acquiring of a child on the level of a luxury.

Opportunity costs also seem to rise with income. Jacob Mincer and Richard Easterlin argue that the foregone income of the wife who bears and cares for children rather than working is one kind of price of children. But other costs of hiring child care (or repaying the attention given by neighbours or relations or older children in underdeveloped societies to infants and small children) must also enter. These costs too are positively related to income. Easterlin's argument that a 'permanent income' (the income to which consumers adopt their behaviors) concept is more relevant to the fertility decision and estimation of opportunity costs than is that of currently measured income.

Non-economic costs, including the psychological, are essentially the time and effort of rearing children that do not compete with parents' economic activity. These cover areas where a redirection of leisure time activity occurs and a 'cost' may be involved even though no financial or opportunity cost is incurred.

How does a parent arrive at his equilibrium level of family size ? This is sought to be read off on a straight line, or curvilinear one, concave or convex with respect to the origin depending on the exercise, against a vertical axis representing satisfaction from consumption of goods etc. and a horizontal axis representing satisfaction derived from having children, the assumption being that the highest level of material goods consumption possible is the vertical intercept at the point the size of family is zero. This can be interpreted as the full or maximum potential level of material goods the family can reach when financial, opportunity and non-economic costs of children are zero. The curve has no intercept on the horizontal axis, since income can never fall to zero if the family has to survive. Between these two extremes the curve measures the rate of substitution between material consumption and family size, or the price of children in terms of material consumption foregone.

Robinson and Horlacher illustrate three curves : (1) hypothetical production possibilities curve (concave with respect to the origin) for material consumption versus psychic satisfaction from having children, implying increasing cost per additional child, (ii) hypothetical welfare-tradeoff curves from material satisfaction versus psychic satisfaction from having children, indicating a series of loci in curves, concave with respect to the origin, each representing total satisfaction or welfare, stemming from material goods consumption and the enjoyment of children ; and (iii) a hypothetical optimal production and consumption of material satisfaction and psychic satisfaction from having children at a tangency point where a convex curve of (i) meets a concave curve of (ii). This point of tangency will indicate the combination of family size and level of material goods consumption that will maximise satisfaction. R & H then proceed to draw two figures showing a series of tangency points in each case to illustrate (1) hypothetical optima of material goods—children tradeoff allowing for increasing costs of children, and (2) hypothetical optima of materials goods—children tradeoff allowing for strong preference for children, (Figures 2 to 4).

Any economic theory of family formation will concentrate on these tradeoff questions and on 'internalised' benefits of fertility reduction, which accrue to the couple itself distinct from external benefits which are reaped by society as a whole. It is agreed that in the long run both society as a whole and individual family units have implicit, and similar, tradeoffs

between various levels of fertility and various levels of material well-being. With the higher levels of fertility almost always involving a 'cost' in terms of lower measured income or fewer material goods per capita, a possible area of conflict, however, exists between the socially desirable and the individually desired pattern of fertility, rooted in the difference between 'internal' and 'external' costs and benefits. This is referred to as the possible divergence between societal marginal costs and benefits, and private costs and benefits of various family size. (Figure 5).

III. DISTRIBUTIONAL ASPECTS OF FERTILITY REDUCTION

Given the diversity of economic and social groups, vertical and horizontal, in any society and at any point of time, there is hardly any pattern of fertility change that will not involve some redistribution of welfare from one to another group. As observed before, it is difficult to say what the incidence of future family planning programmes is likely to be. It might indeed fall much more readily on persons of middle class origin who do not become marginal workers than on those of working class or peasant origin who might become marginal workers. Again, as Leibenstein observes, it may very well be that the middle class or other non-marginal births provide most of the 'residual' inputs such as education, technique change, entrepreneurial activities which in some situations account for more than 50 per cent of the growth in national income. According to Robinson and Horlachcr, the actual situation arising at the level of society as a whole will involve both gainers and losers ; the higher fertility group, in reaching its maximum level of welfare, subject to its constraints, will through externalities be 'destroying' some of the possible well-being of the low fertility group. What would matter, they add, is that the high income, low fertility group must be willing to pass the cost of providing subsidized information and services to the higher fertility, low income group in an effort to reap the net gains if the negative externalities can be eliminated.

IV. CONCLUSIONS

The benefit cost approaches to family planning programmes implicitly proceed on the notion that the present is the crucial time period. This gives sanctity to the discounting procedure but one can argue with equal force, with Demeny[23], that public policy must weigh benefits to future generations as well as benefits to the present generation, particularly as now, more than ever before, the potential for economic growth is much higher than the potential for population growth. It must also be recognised that the benefit cost technique demonstrates the superior effectiveness of a family planning programme over investments in alternative projects to such an overwhelming degree as to be almost self-defeating.

It is pertinent to mention some of the elements of uncertainty and the guess work involved in such exercises. For example, because of difficulties of measurement, many important factors are left out of reckoning like the better health of mothers and children, and the greater care that can be given to children of smaller families, the averted psychological costs of an abortion and/or an unwanted child, the greater output resulting from improved health and greater education, and effects of more rapid economic development, urbanization and the education and employment of women. There are other important problems of measurement. In the absence of an acceptable general equilibrium model, a partial approach to the

measurement of economic effects becomes unavoidable. There are difficulties in estimating the number of permanently prevented births in a family planning programme as opposed to the number and time pattern of 'delayed' births. There is the problem of substitution, or of separating the impact of a family planning programme from the reduction of fertility that would have occurred any way as a result of improvements in socio-economic conditions. The one great gap in macro-economic models for the underdeveloped countries is the inability of the economist to recognise the reality of the benefits of children in an agrarian society and his inability to evolve a model in which such benefits can be recognised to start with and then rapidly reduced over a certain time span through substitution by package of carefully worked out economic welfare and family planning programmes ; that is, by employing a dynamic macro-economic growth model which will generate a time path of the benefits and costs of alternative demographic, economic and social welfare policies. The decision maker can then discount these streams at a rate and to a year of his own choosing.

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Present Value of Benefit or
costs at 4% Discount.

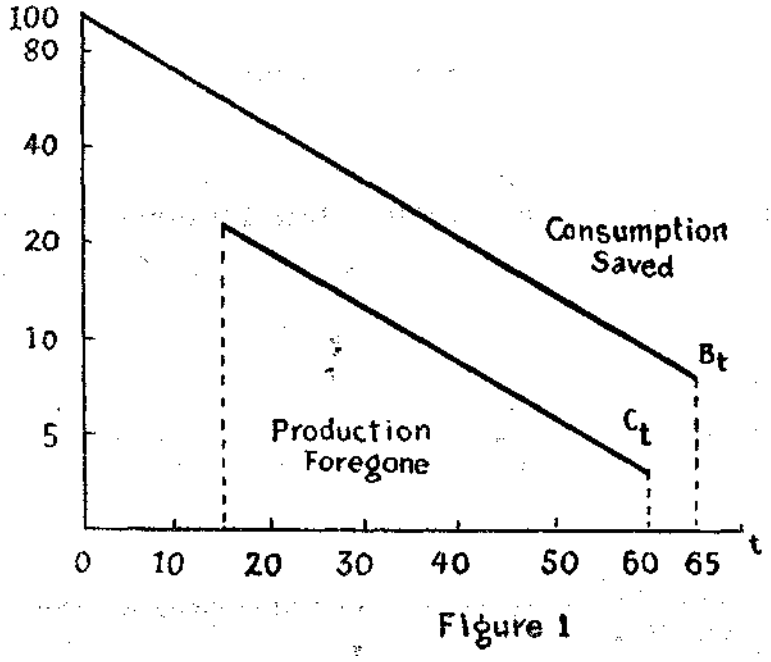

Figure 1

Hypothetical Production Possibilities Curve for Material Consumption versus Psychic Satisfaction from Having Children (See Para 40).

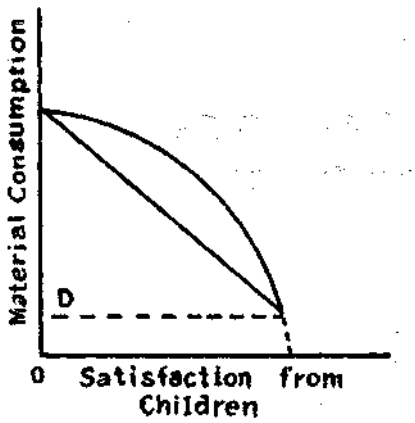

Fig. 2

Hypothetical Welfare Tradeoff Curves from Material Satisfaction versus Psychic Satisfaction from Having Children (See Para 40).

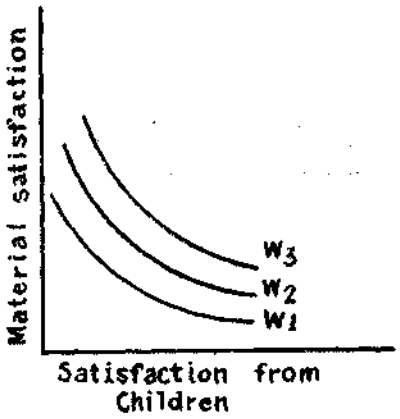

Fig. 3

Hypothetical Optimal Production and Consumption of Material Satisfaction from and Psychic Satisfaction from Having Children (See Para 40).

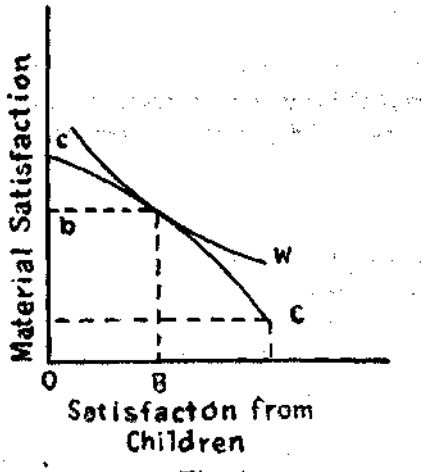

Fig. 4

Illustration of Possible Divergence Between Societal Marginal Costs and Benefits and Private Matginal Costs and Benefits of Various Family Sizes (See Para 41).

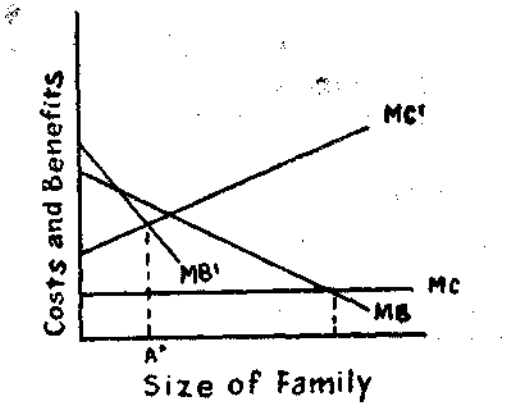

Fig. 5

Acknowledgement: Robinson W.C. & Horlkcher D.E; Population Growth and Economic Welfare Reports oa Population/Family Planning No.6, pp. 25-6 and 30.