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HAWKINS

MAR, 1970

POPULATION GROWTH: IMPLICATIONS FOR ECONOMIC AND
SOCIAL DEVELOPMENT

by E. K. Hawkins*



Introduction

The interest of the World Bank Group in population growth follows naturally from its role in promoting the economic and social development of its member countries. It has expressed this interest more forcibly in recent years as it has become apparent that more and more of the poorer member countries of the Bank are experiencing rates of growth of population which are not only uniquely high by historical standards, but also a heavy burden to these countries. In expressing this concern, a number of arguments have been deployed linking population growth to the development process. These arguments are by no means original, dating back as they do to the earlier postwar years when demographers and economists combined their analyses and applied them to the developing countries. The arguments appear to be logically correct and they can, in principle, be quantified. In essence they rest on the proposition that high rates of growth in population reduce the rate of growth of the output of goods and services, and still more the rate of growth of that output measured on a per capita basis. The result is that the emergence of the poorer countries from poverty is unnecessarily prolonged by the increase in the number of people who must share the national income.

It might be thought that these propositions would be generally acceptable and could be expressed in a way that is not controversial. This has not been the case, however, and one of the purposes of this paper is to explore the reasons for this and try to understand the nature of the objections that have been made against these arguments. This can only be done by setting the problem against a wider intellectual background. It is not surprising that controversy has been aroused by the use of such arguments by an international organization pledged to the promotion of economic development. Historically the relationship between economic questions and population questions has always been stormy and controversial, the more so when economists have gone beyond analysis to the prescription of policy.

Naturally in pursuing their arguments economists tend to give less weight to those aspects of human welfare which lie outside their professional competence. Population growth is ultimately the result of human relationships between men, women, children, families and society, and these relationships clearly depend on many social and cultural factors. There is always bound to be intellectual resistance, therefore, to arguments which maintain that the decisions determining the level of human fertility should be greatly influenced by economic considerations.

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It should be made clear, therefore, that in discussing the relationships between population growth and economic and social development there is no intention of belittling the role of social factors; rather the intention is to stress the continuous interrelationships that exist between economic and social development. Priority is given in the discussion to economic development only because that is the special interest of the World Bank Group and secondly, because it is economic development, as defined below, which makes possible social development. Economic development provides the means, in the form of greater wealth, whereby society can change and take on those aspects subsumed under the broad description of "modernization". By this is meant the whole process by which societies develop from traditional stable ways into growing communities characterized by rising income per head and a vastly increased range of opportunities available to the individual member of the society.

Population and Development Objectives

For the purposes of discussion, economic development will be defined initially in terms of rising incomes per head of the population. This useful average is widely used as an indicator of an improvement in economic welfare, because it takes account of both production and population change. Developing economies have historically experienced rising populations, and the output of goods and services must clearly rise faster than the population for economic welfare to improve. At a later stage we shall introduce other possible development objectives. Rising GNP per capita, however, offers not only a simple general test as to whether development is taking place, but it is also a measure which meets with wide acceptance.

The economic arguments for a smaller rate of population growth have been developed in the last two decades on the basis of an analysis of the links between demographic change and general economic development. As with many other intellectual insights the essence may be presented fairly simply; it is possible to increase the income per head of the present population by restricting the number of people added to that population. In any growing population a broad structure emerges over time in terms of the number of males and females in particular age groups. An acceleration in the rate of growth causes the structure of the population to change so that the relative importance of younger people in the total increases. If higher rates of growth of population persist, as a result of high fertility accompanied by reduced and falling mortality, the effect on the average age of the population will be quite marked. The relatively high rates of growth of population now being experienced in developing countries stem from this situation. They are the result of success in controlling the causes of mortality, especially in the control of diseases which previously caused high rates of infant mortality.

Considerable resources are required to feed, clothe, house, educate and prepare human beings for adulthood. It therefore follows that high fertility leading to very large additions to the population each year imposes a burden on society, if these additional members of society are to be properly equipped to fulfill their promise as human beings. The output of goods

and services available each year has to be shared amongst various end-uses. The distinction most commonly made, however, is between those purposes which add to the current consumption of society and those which add to the capital stock. Economic development depends largely on the amount and quality of capital available and improvement in the quality of the human resources in terms of the knowledge, skills and technology they command. Growth resources can be applied to improving and adding to the capital stock and in improving the health and education of each child if the demands made on current output for the support, training and education of a larger number of children can be reduced. If the population is growing rapidly the choices will be difficult; the support of children may have to be neglected in order to divert resources to investment. The choices are easier if the net additions to the population are small in relation to the total.

The possibilities that exist for improving incomes per head if the rate of growth of population can be reduced are permissive rather than mandatory. It does not follow automatically that total income will rise continually as the rate of growth of population decelerates; it can be demonstrated, however, that it will be possible to apply the output of goods and services in such a way as to have a higher rate of growth of GDP per capita with a lower rate of growth of population.

Since one cannot carry out controlled experiments in economics the demonstration of these arguments must be on the basis of logic and historical experience. Although the inability to link cause and effect unequivocally is no different in this part of economics from many other parts of the subject, it does give rise to problems of persuasion. It is not possible to demonstrate readily to a skeptical minister of finance that output per head will grow faster if the rate of growth of population were to be slower. In addition, the course of population change is relatively slow although proceeding with cumulative effect over time. In two or three generations there will be many other changes at work, both social and economic, which make it impossible to isolate one set of forces at work. Rigorous scientific demonstration of these propositions, therefore, is impossible.

A failure to convince through intellectual argument does not mean that a case is wrong; with a subject as charged with emotion as is population it may take more than logical argument to bring about the recognition that there are substantial disadvantages arising simply from a growth in numbers. For the greater part of history, when the human population did not increase or did so only slowly, men had no reason to measure changes in their numbers accurately, or to analyze the causes of those changes. The measurement of demographic change developed only when population growth became a marked feature accompanying other aspects of the social and economic changes that set the societies of Western Europe and North America upon the path of modernization and produced the industrialized, mainly urban economies of today, with high standards of living. For the developed economies rising population have always been associated with rising incomes per head, so that for most people brought up in such an environment it appears slightly paradoxical to argue that a growing population may have a harmful effect upon individual welfare.

Objections to the Argument

In reviewing the objections which have been made to the economic argument for a slower rate of growth of population, it is useful to distinguish between a number of different trends of thought. There are, first of all, those who deny the validity of the arguments used, either on the grounds that they are incorrect in logic or because they are not relevant to the real world. A second group of objectors include those who argue that other aspects of population are more significant than rates of growth; such people wish to concentrate instead on the pattern of population density and the relationship of population to natural resource endowment. A third group consists of those who have substantial religious, political and social reasons which lead them to reject the conclusions of the arguments, rather than to question the logic.

It is also useful to distinguish between the constituencies to which the arguments are addressed. Generally speaking, the first and most important level of persuasion is aimed at those in authority in developing countries who will have some influence over the determination of policy. This should also include those who lead in cultural and religious fields; they are often more influential over public opinion than politicians and administrators. Unless this key group can be persuaded of the truth and significance of a relationship between population growth and development prospects, there is little hope that the mass of the people themselves can be educated in these matters.

These key officials and leaders are important not only because their conversion will open a route to the possible persuasion of the mass of people, but also because this is the group who need to follow through their convictions with appropriate official action. We must, therefore, distinguish between two kinds of objections: There are those who reject the arguments and their conclusions, and those who while accepting these arguments and conclusions are skeptical about the possibility of using public policies and actions to influence the individual family decision.

The problem must always be viewed from two levels, that of persuading the power structure in a country that there is a link between population growth and that country's economic development, and the need to persuade the individual family that the choices they will make about family size have a bearing on their own welfare.

The Economic Argument and its Opponents

The objections of those who reject the economic arguments are difficult to discuss in a summary way. They tend to have a common theme, however, which is to cast doubt upon the direction of the relationship proposed between population growth and development. Clearly there is always a two way interaction and one viewpoint holds that the more correct hypothesis is to regard population growth as a stimulant to economic growth, rather than as a brake on the grounds that it makes possible the benefits of economies of scale attainable with larger populations. It is also argued that population growth gives the necessary incentives to make the changes called for in social and economic organization if economic progress is to be possible.

It is not denied that such effects are possible; the issue is rather whether they are always or even typically present. Population growth may make it easier to reap the advantages of a scale of operations not available below a certain absolute level of population. Similarly, it may also facilitate changes in organization. An increase in numbers, however, will not of itself contribute the other factors vital to development, especially the improvements in the quantity and quality of capital and labor. Higher per capita incomes are more important than more numbers of people in the development process. The market for manufactures, for example, depends on rising incomes per capita and demand is highly income elastic. In any actual situation one is bound to ask what are the costs as well as the benefits of population growth. Where it is held that the growth of population may have beneficial results, it must also be demonstrated that such benefits are not cancelled out by costs imposed as a result of population growth.

The second kind of objections entered against the economic arguments are those made in an attempt to show that the logic is defective. In other words, the arguments are disputed in terms of the analysis itself. Those who take this position are mostly economists and the fact that they are not fully agreed amongst themselves should not be taken to indicate that the arguments (on which policy prescriptions are to be based) are not well founded. The discussion reflects the results of the greater interest taken by economists in the subject of population in the last five years. A topic which was (in recent years) of interest only to a few writers has attracted more attention now that it has moved into the sphere of policy and action. Out of this wider discussion, which is still under way, much better established hypotheses will emerge and the whole economic case for population control will be more firmly established. In the meantime the debate continues, often with a certain amount of heat.

The issues under discussion can be better understood if the main outlines of the arguments linking population growth to economic development are briefly summarized. They have been built up along two lines of thought. The first has been couched in a cost/benefit form, organized around the calculation of the net savings to the economy that follow when fertility falls as births are "averted". The second line of thought was not, at first, placed in a cost/benefit framework; instead it followed a macro-economic approach to trace the implications of lower fertility upon the main economic variables, and the ultimate effect upon the total output of goods and services and GDP per head.

The former approach has been presented in terms of the costs and benefits to society of preventing an additional birth. It proceeds by calculating the total demands on goods and services that would be made by one individual throughout his lifetime and compares that total with his prospective contribution to production. The difference, positive or negative,

is then regarded as some measure of the "net worth" of that person to the economy. Except under certain rather special assumptions^{1/} this proves to be negative so that it will always be to the economic benefit of society (defined in this way) if an additional birth does not take place.

These results have been found unconvincing and paradoxical by some economists, and the normal reaction, when faced with what seem to be apparently paradoxical conclusions, is to look either for hidden assumptions, or for deficiencies in the logic of the argument. Several critical examinations of the methodology, however, have not so far succeeded in providing a refutation of the arguments. It does appear to follow quite generally that if a birth is prevented that would otherwise have taken place, the rest of society will: (a) at least be no worse off than they otherwise would be; (b) will have at least the same total output to dispose of on a per capita basis during the period when the child would otherwise be reared, and (c) in all but the most unusual circumstances, output per head will be no lower during the period when the unborn person would have been in the labor force. There is a very strong presumption that both output and output per capita will be higher in the longer run as a result of favorable changes that can follow this marginal reduction in fertility.

It is worth reflecting for a moment upon one type of reaction to these arguments. Some people find it strange to be discussing the value of human lives in monetary terms, especially in the context of possible policy action to influence fertility decisions. They find that the analysis is set in what is, even for economists, an unusually austere logical framework reminiscent of the period when economics was described as "the dismal science".

These reactions are usually based on an incomplete understanding of the purposes for which the arguments are to be used. The cost-benefit calculations are required for the allocations of resources in the most effective way, so that it is necessary to work out rates of return, or cost/benefit ratios, in the process of choosing between expenditure alternatives. Hence most interest in cost/benefit methodology in practice has been in its application to expenditures on programs which may have a direct impact on population growth, of which family planning programs are the most important example.

^{1/} These are: (a) the possibility of increasing returns to scale in ten to fifteen years time, when the "birth averted" would be entering the labor force, and (b) a prospective labor shortage which would raise real wages sharply over the same period.

The weighing of costs against potential benefits takes place all the time with respect to family decisions about fertility, presumably every time that conscious control is exercised over the number of children in the family or in their spacing in time. This is assuming that the means of choice are available to parents. A very powerful argument in favor of making the means of choice as widely available as possible is to enable parents to exercise this choice and to take account of the costs and benefits as they see them. The methodology under discussion sets out systematically those factors of interest to society which can be quantified; it is of interest to know that it demonstrates that there is likely to be a net benefit to society from a birth averted, but the method cannot take into account the intangible factors that, on balance, lead parents to decide upon a positive number of children, rather than to have none at all. It is necessary to mention this obvious point because it is occasionally forgotten when the above arguments are criticized on the grounds of a *reductio ad absurdum* that they logically support the conclusion that all births should be prevented.

This first approach to providing a satisfactory intellectual base to the measurement of the economic benefits that will follow from a reduction in the rate of growth of population is couched in marginal terms. Obviously the prevention of a single birth in a large population will have a miniscule absolute effect upon incomes per capita. Practical interest centers upon changes in fertility which make a dent in the rate of growth large enough to have a significant effect upon economic development. In principle this only requires the arguments to be extended to a larger number of births. Once this point is reached, however, there are advantages in using the second approach developed through the macro-economic route which looks at all the aggregates in the economy and does not talk about marginal changes that would follow from the existence of one more, or one less, individual. This second approach demonstrates that it is, in principle, possible to have higher incomes per head solely as a result of a reduction in fertility. The argument proceeds by analogy, comparing identical situations with and without reductions in fertility.

These macro-economic arguments were originally developed for persuasive purposes and the experience has been that they are more successful in this role than the marginal methodology in cost/benefit terms. However, the macro-economic arguments are now being adapted for cost/benefit calculations, an application which offers many advantages. The most important is the way in which population changes can be integrated with the other major elements of economic development so that their combined influences upon incomes per head can be measured. The interrelationships between such key magnitudes as savings (both public and private), the amount and efficiency of investment, exports, imports and foreign capital flows can all be explicitly linked to assumed policy mixes and the trade-offs estimated between population changes and other variables.

Cost/benefit calculations in this wider framework of analysis also yield relatively high rates of return from expenditures bearing directly on fertility. Again there have been problems of credibility; *reductio ad absurdum* arguments have been used to the effect that if the rates of return from expenditures affecting population growth are so high, why then do not

governments allocate all their investment expenditures to family planning and similar programs? It does not take much thought to appreciate that this is itself an absurd position to take.^{1/}

In summary, therefore, it can be said that the technical discussions now proceeding on the best way to demonstrate the relationship between population growth and economic growth are likely to improve and refine ideas already of some standing. Out of them will come a greater understanding of the nature of the problem and an improved methodology to handle it within an integrated framework of economic and demographic analysis.

Other Objections

There is one other objection that is grounded in an economic argument. It remains the most common opinion raised against the existence of a population problem defined in terms of rates of growth. It is often employed to discount the urgency of the problem. This is the belief that population questions can be discussed in terms of the availability of land and other natural resources, so that population density can be used as a measure of the existence of a population problem. This is a viewpoint that is strongly expressed in those few countries left in the world which have areas that are thinly populated and where the settlement of additional people on the land may still be possible, provided that the associated investments can be made to make such settlement possible.

The real issue at stake in such countries is not whether there are such resources which can still be used for production, but whether the expenditures required to put them into production are the most profitable uses of scarce capital. The countries which still have such unused land available - principally in Latin America and Africa - also have high rates of growth of population. For them the settlement of people on new land may appear to be an escape valve for the rising pressure of population resulting from the high rates of growth. However, there would still be a very high yield to the economy, in terms of per capita income, if the rate of growth of population could be lowered.

Secondly there is the question as to whether settlement on new lands offers a sufficient safety valve for population pressure, bearing in mind that land, by itself, is of no productive value (other than for purely subsistence purposes) without associated investments in transport, communications and commercial services. Experience in both Africa and Latin America suggests that the high rates of growth of population cannot be accommodated in this way, either because the investment requirements

^{1/} Cost/benefit calculations take account of the scale of expenditures proposed and the results will be sensitive to this factor. Secondly, a program of action, such as a family planning program, need only be expanded as far as is necessary to achieve the objectives required. It makes no sense, therefore, to talk in terms of the possibility of governments allocating all their investment expenditures to one such program.

are so large that they cannot be met, or the people who might become settlers do not wish to take on that role. Instead, the growth in numbers accumulate in the already settled areas. The alarming increase in population of the slum areas of the big cities is one indication that the "empty lands" thesis cannot be an effective rebuttal to the argument identifying the population growth rate as the key variable, rather than population density.

Finally, mention must be made of the continued importance of religious and political objections, either to the results of the analysis of the problem in terms of rates of growth, or to any attempt at policy prescription. Certainly the balance has changed in recent years so that it is now political objections which are more important in practice. The idea that the advocacy of population control is somehow in conflict with national ideals and objectives springs from a feeling that equates population size with an enlargement of the power of the state. They are also frequently associated with non-rational arguments centering on race, involving the fear that the advocacy of policies aiming at reducing fertility is really inspired by a desire to alter the racial balance in a particular way. Unfortunately these ideas are often influential amongst politicians and leaders of public opinion in countries where there is much to be gained by anticipating the effects of population pressure. This requires not only an appreciation of the links between population growth and development at the technical level, but it also requires an act of the imagination on the part of national leaders to project forward the slow unfolding of these consequences. Fundamental to the whole problem under consideration is the influence of time. One is left with the paradox that those most easily persuaded are governments who are already aware of the consequences of past changes in the population variables, whilst those who most need to be warned to take action are countries which have yet to experience the full impact of high rates of growth of population.

This point comes out clearly from the World Bank's own experience in the few years since it first undertook to discuss the interrelationships between population growth and development in the context of its own dialogue with member countries. The countries most responsive to this initiative have been those who had already recognized the existence of a population problem and who, in most cases, have already adopted policies aimed at influencing population growth. They are mainly the larger countries in Asia and some of the smaller island economies that feel the impact of population pressure in a vivid way. On the other hand, it has not been so easy to discuss these questions with the countries of Latin America and Africa who, in many cases, have higher rates of growth of population than the Asian countries. The reasons are often complex - a mixture of political, religious, and cultural influences which make it difficult for governments and officials to accept the arguments outlined above.

Public and Private Objectives

Persuasion of the national leadership is only the first step which might lead to action bearing on rates of growth of population. It is a vital step, because it makes possible the next level of persuasion - that aimed at individual families, whose collective decisions determine fertility. All too little attention has been paid by the social sciences to the determinants of these family choices in developing countries. Economists are beginning to be interested in studies of the family as an economic unit, but until there is a better understanding of the determinants of family choices, public actions aimed at influencing fertility will be expedient in nature, rather than well based on a knowledge of the factors that are important to family decisions.

What can be said, however, regardless of the cultural, social or economic background, is that there is no necessary reason why the sum total of individual family decisions on family size should result in a level of fertility that is consistent with rapid economic development. Individual families are most unlikely to take account of the generalized relationships between population change and the growth of national income that might be persuasive with national leaders.

This possibility of a divergence between the objectives of families and the objectives of society as a whole is one that occurs in other fields and which has received attention from economists before. The possible importance of such divergences between social and private benefits can be illustrated by the remark of one of the Indian farmers who, having benefited from the increase in output resulting from the use of the new breeds of wheat, commented that he felt that he could now afford to abandon family planning and have more children.

This example can be used to illustrate the role played by objectives in decisions of this kind; there is a clear implication that, in this case, the dominant influence is total family income which has increased in such a way as to permit it being shared between a larger number of members of the family. Presumably the resultant prospective income per family member is considered adequate within the frame of reference of that family unit. It could easily be demonstrated that income per head would be much higher if family size were to be limited, but this possibility must, in this case, be outweighed by other objectives. Decisions on family size are made within a given social context and they assume certain possibilities - in this case, that the farmers' world will be such as to permit the "target" number of children (allowing for the possibility of some children not surviving to adulthood) to be raised, educated and equipped for adult life. On many of these matters the family may be very ill-informed, so that they act on the basis of incomplete and inaccurate information. While this may be a common condition in illiterate, peasant societies, it is also possible that families may act on the basis of information that is correct and relevant to them as an individual unit, but which may turn out to be totally wrong if all families act in that way. Thus if all the farmers who benefit from the "green revolution" attempt to realize its benefits in the form of larger families, the net effect will be that nobody may gain in terms of incomes per head, even if total incomes rise.

The Importance of Other Development Objectives

The task of persuading the individual family to reduce its fertility may well be harder than that of converting officials and governments to work for lower rates of population growth. Both tasks may be eased, however, if a wider range of development objectives is taken into account. Much of the discussion about economic development proceeds on the basis of a single criterion - that improvements in economic welfare can be measured by changes in GNP per capita. This is consistent with a wide variety of possibilities, however, especially as to the form in which different elements of society share in this increase in welfare.

GNP per capita is an index of relative wealth or poverty that is of value for certain purposes, but it needs to be supplemented by attention to other objectives that are also influences upon fertility. Perhaps the main difficulty with GNP per capita as a criterion is that it is so general as to be uncontroversial. A more explicit discussion of wider development objectives reinforces the general economic arguments in favor of lower rates of population growth.

There is less likely to be agreement on these wider objectives, because they are less general and introduce more controversial issues. Two of the most relevant concern the distribution of incomes and wealth and opportunities for employment. It is not possible to put together an adequate quantitative picture of the distributions of income and wealth in the poorer, developing part of the world. What evidence there is indicates that they are probably more unequal than in the richer parts of the world. There is a close link between rapid population growth and the distribution of incomes and wealth which operates both at a world and a national level. Richer countries, and the richer groups within a country, tend to have lower fertility, with the result that they tend to grow at a slower rate. This, in itself, makes the distribution of income and wealth more unequal, per capita, at every level of aggregation. This feature is alluded to whenever the gap between the developed and the developing countries is discussed. Two thirds of the world's population now live in the poorer countries; by the year 2000 this proportion will have risen to three-quarters.

The differential population growth between rich and poor applies also within national boundaries. The better off in all communities, regardless of culture, religion or race, find a means to limit their fertility, just as they also enjoy low mortality because they can command good medical services and live in better environments. The poor tend to have higher fertility and mortality, but there has been a steady improvement in the death rate, even in the poorest countries and in the poorer parts of the population. The resultant more rapid growth in numbers of the poor is now reflected in the more ugly phenomena of developing countries - landless peasants, urban squatters, persistent unemployment and the increasing polarization of society between rich and poor.

The relative increase in the numbers of the poor is accompanied by a purely economic consequence which exacerbates the inequalities of income and wealth. Rapid rates of growth of population, with limited natural

resources and the ownership of capital in private hands, results in a shift in the distribution of the national income, so that the share of landowners and capitalists rises at the expense of the share of labor. If the ownership of land and capital is at all concentrated amongst the population this tendency will worsen the inequalities of income and wealth.

It follows that if a more equal distribution of incomes and wealth is acceptable as a development objective this, in itself, provides support for the public provision of family planning services and other measures aimed at reducing fertility amongst the poorer part of the population. The family planning program which is nationally financed out of public revenues provides a subsidized service which is similar, in principle, to other public activities which seek to bring benefits to one group, with the costs shared by others who may not make use of the service. Since fertility normally declines first amongst the better off in the community, such a subsidized service is attempting to bring the freedom to choose a smaller family size to those who may not have either the means or the opportunity to buy such services in the market place. At the same time, it tends to raise incomes per family member directly, to the extent that fertility falls.

The ability to choose the size of family and thus restrict the number of dependents is important to key groups and individuals in developing countries who are ambitious to escape from poverty. A large number of children will impose a burden of support on such people that may divert energy and talent from other activities beneficial to economic development. Freedom to choose in this sphere gives an individual a sense of conscious control over a key area of his life.

The successful way in which the means for family planning can be provided commercially has occasionally led to the suggestion that it is not necessary to provide subsidized family planning services if private channels could be encouraged to serve a wider public. Certainly there is a need to encourage the unsubsidized dissemination of both ideas and methods in appropriate circumstances, but the case for a subsidized public program turns again on the time factor - it can, in principle, have a wider effect more quickly. Moreover, in practice each approach can go forward simultaneously and reinforce the other.

A second possible additional objective of development, other than an increase in incomes per capita, is the provision of employment opportunities. The link between employment and population is fairly obvious; the former has always been of concern to those working for development, but it has begun to claim much more attention since it became clearer that even relatively successful rates of economic growth were not generating sufficient employment opportunities to absorb all those seeking employment. It is no coincidence that the problem emerges now; the accelerating rate at which people are now entering the labor force in the developing world reflects, with a ten to fifteen year lag, the acceleration in population growth rates that occurred in the early 1950's, mainly as a result of an improvement in infant mortality.

This contemporary example should, in itself, be the vehicle by which the link between social and economic development and population growth becomes better understood. By themselves, however, official policies which aim to reduce fertility in the present do nothing to allieviate the existing unemployment problem. What they can do is to reduce the burden of poverty in the families of the unemployed, and make the longer-term solution to the problem much easier.

Another development objective supplementary to, and made possible by rising per capita incomes is that of improving the quantity and quality of the public services. This covers a wide range of activities, including better administration, more attention to law and order, better educational facilities at all levels and improved health and social services. There has been considerable discussion about the possible interrelationships between changes in these factors and trends in fertility. Much of this discussion is based on the plausibility of certain links, rather than on established empirical relationships. Pending more work to quantify some of these relationships the presumption is very strong that there are self-reinforcing links between falling fertility and improved health and education services.

Special attention has been given to the likelihood that fertility will fall if the health of mothers and children can be significantly improved; reductions in infant mortality provide assurances that children have better chances of survival, reducing the number of conceptions needed to obtain a family of the desired size and composition. The health and life expectancy of mothers can also be markedly improved if they have access to the means by which they can regulate fertility and space their births. It is interesting to note that many people not easily persuaded of the general economic arguments for lower rates of population growth are more impressed by these benefits to the health of mothers and children. (In cases where it can be quantified, the economic value of healthier children and mothers may well be sufficient, in itself, to cover the costs of providing a family planning program.) There are also distributional aspects to take into account where such services are provided free, or at a subsidized rate. This is another aspect of the use of such programs as a vehicle for ensuring that benefits accrue to those who could not otherwise obtain them by their own private actions.

The links between education and fertility trends are also close, although difficult to quantify. On the one hand the desire to increase the quality of family life by the provision of more and better education is frequently a powerful incentive to the limitation of family size, always provided that educational opportunities are within the reach of the families concerned. At the same time, the ability of the state to provide education services of any quality depends partly upon the number of children who must be served. One of the most easily demonstrated consequence of a reduction in the growth rate of population is that it will, in principle, free resources which can be used to improve education facilities for a smaller number of children.^{1/}

^{1/} See paper prepared by Gavin Jones - "Population Growth: Implications for investment in education: case studies."

Education plays a part in a more fundamental sense, however, in the dynamics of population change; knowledge of the ways in which fertility can be limited and family size reduced must be widely diffused throughout the community. This is the easier to achieve the more literate and educated the population. The techniques of persuasion through the medium of modern communications do not depend upon literacy for their effectiveness, but they are likely to be more successful with a higher level of literacy amongst the population. The more sophisticated arguments linking population growth, development prospects and the quality of the environment will certainly not be accessible to non-literate people and it may yet prove to be difficult to convey them even to the more educated populations of Western Europe and the United States. The spread of education, therefore, carries with it the opportunity and the need to disseminate the case for population control.

The wider availability of better public services bearing on the health and welfare of the individual is one of the fruits of economic development. An increase in the output of goods and services makes possible a whole range of new possibilities that are subsumed under the heading of the modernization of society. Once such changes get under way they transform the traditional ways of life and the results are bound to affect fertility. A reduction in the rate of growth of population will follow and it will have a reinforcing effect upon the wider diffusion of social changes. Demographic transition and economic and social development are so clearly intertwined that there is little controversy about such conclusions. Controversy arises at the point at which the suggestion is made that a decline in fertility (or an acceleration in the rate of decline) can be brought about, or reinforced by suitable public action.

What can be said with some conviction, however, is that the case for such public initiative is strengthened considerably when the range of development objectives is widened. All the above subsidiary objectives - a more equal distribution of incomes and wealth, better employment possibilities, improved health services, higher quality education and other improvements in the standard of public services - they can all be achieved more easily with a lower rate of growth of population. All of them are linked with the freedom to choose the size of family, and the diffusion of that freedom throughout all classes of society is itself an objective of some importance.

Conclusions

We began by defining economic development in terms of a single objective - an increase in the output of goods and services per head of the population. This single, summary measure can take account of the two dimensions that impinge on individual welfare; the output of goods and services increases, and the individual's share depends upon the total numbers in the population. The arguments for a reduced rate of growth of population were then summarized as related to this single valued objective. The proposition that it is preferable to have a higher income per head is likely to command wide support. Economic development, in this sense, is a necessary condition for social development.

Certain other development objectives (also in the nature of value judgments) were then considered. One was the proposition that the gains from economic development should be distributed through society in a fair and equal fashion. Another was that development should include the provision of sufficient opportunities to employ the additional numbers entering the labor force. Other possible objectives would be the provision of public goods and services considered especially important - better health facilities, more education, better housing, etc.

The arguments relating population growth to these multiple objectives all have in common the theme that it will be easier to achieve any given improvement in the quality of life if the rate of growth of population is falling rather than rising. The introduction of such multiple objectives does not necessarily make it easier to persuade people to accept the idea that positive action should be taken to induce a fall in fertility, or to hasten a decline already under way. There are now more possible reasons for disagreement, because of the scope for different attitudes about the value of the objectives.

There are many reasons why it will not be possible to obtain unanimity on the desirability of action to promote a decline in fertility. However, at least the issue is clear. It is not whether a decline in fertility will, or will not accompany the modernization of the economy; historically this has always happened in all successful cases of development. The controversy is rather about the relevance of the arguments that indicate that the whole process of economic and social development might be speeded up if fertility were to be reduced by public policy and action.

Perhaps the basic feature, therefore, which lies behind the continuing controversy is a lack of understanding of the factors which determine fertility decisions in various social and cultural backgrounds. If this is so, this conclusion indicates where some of the thrust of future activity should be placed; it should be directed towards greater knowledge of the determinants of the decisions about family size. It might then be possible to devise better means of persuasion which would initiate and encourage a decline in fertility within the framework of voluntary choice, which must always be a basic assumption in this field.

As understanding increases, so we can hope that the amount of controversy surrounding the discussion of the links between population growth and economic and social development will diminish. At stake here is the welfare of the many millions throughout the world who are not participating in the process of economic and social development because of a rising tide of humanity. Whether we like the idea or not, it is going to be necessary for the human race to choose between the quality of life and the numbers who share that life on this planet. In the last resort this is not a moral or philosophical judgment, it is a conclusion which follows ineluctably from the fact that the earth is of a given size and has limited resources.

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ECONOMISTS AND POPULATION STUDIES

by

E. K. Hawkins*



"We begin with growth of population, for it is people who produce economic growth and consume its yield."
(S. Kuznets) 1/

Introduction

Some economists have always been interested in population and especially in relationships that may exist between population and economic development. The subject is again of topical interest because we are witnessing a resurgence of interest in population questions, a movement that began in the mid-1960's and is still gathering momentum. However, the number of economists concerned with the subject as a specialty is still very small, compared with those interested in other topics, and their involvement in the matter has been accompanied by considerable controversy. If it were possible to attract more of them into the field it is possible that some of the controversies could be settled; at the least, it would be possible to clarify more of the issues.

The chief reason for the renewed interest in population questions has been the increasing recognition of the implications that high rates of population growth may have for the developing countries, coupled with the possibility that public action, (especially in the form of national family planning programs), may be able to influence these growth rates. The significance of this feature is linked to one of the chief reasons for the long standing interest of economists in population - the desire to go beyond an understanding of the subject and be able to make policy prescriptions.

However, it is a sobering reflection that what seems most frequently to bring down the wrath of both fellow economists and interested laymen on the heads of the population economist are the policy prescriptions in which they indulge. I have the impression that such reactions are more violent in the population field than in other areas of economics, despite the fact that economists are notorious for the violence of their controversy.

1/ S. Kuznets - Modern Economic Growth, (New Haven), 1966, p. 34.

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I am indebted to Messrs. P.D. Henderson and T. King for their comments on an earlier draft of this paper.

There are both historical and psychological reasons for this feature; the historical aspects I will defer, for the moment, but the psychological reasons should be recognized at the beginning of any discussion of the economics of population. We are here dealing with basic human processes of births and deaths; intimate human relationships are involved and the whole subject is intertwined with religious values having their roots deep in history, or even in prehistory. When we enter this area of discussion we carry with us the legacy of all those who have helped to form our particular social and cultural background. Every man is his own expert on questions of population.

What this means is that we have, as economists, to be even more careful than usual to avoid becoming the victims of implicit value judgments in this field. Further, we cannot ignore the evidence provided by other specialists concerned with population matters - those in the medical sciences, genetics, demography and the other social sciences; this is a subject, par excellence, where an interdisciplinary approach is required. What, in these circumstances, is the special contribution of the economist? Or, to put the question in a slightly different way, what should we expect economists to know about population matters? It is chiefly to this question that this paper is addressed.

It is, of course, entirely possible that there is a simple answer to the question why few economists work in this field. The subject may be either not important enough, or not interesting enough to engage the talents of more than a few members of the profession. These possibilities are mentioned at the beginning so as to make it clear that there is no intention to try and argue that a topic is more important than it really is. Economists should apply their own rules to their own subject - where talent is scarce it should be allocated between topics in the most productive way. If population matters do not require much attention from the economist, let us pass on to more important matters.

Population and Economic Growth

The starting point for an economic interest in population seems fairly clear - it springs from our desire to understand the origins and processes of economic growth. Economic history bears this out and it follows also from the history of economic thought. It is also the starting point for a development institution, such as the World Bank, which exists to promote the economic development of its member countries and needs to understand the processes of growth before it can consciously intervene in them.

To support the above assertion I will refer to one of the leading authorities on the interpretation of the historical record, Professor Simon Kuznets. In one of his recent volumes summarising many of his studies he begins his discussion of the nature of economic growth in the following way:

"We identify the economic growth of nations as a sustained increase in per capita or per worker product, most often accompanied by an increase in population and usually by sweeping structural changes." 1/

Modern economic growth, that is development associated with structural change and the modernization of society, has always been paralleled by population increase. Kuznets goes on to discuss the paradox inherent in this correlation; if, for economic purposes, we look at income or product per capita as an indicator of welfare one would expect countries to fare better by such a criterion, the lower the rate of growth of population and the higher the rate of growth of output, yet we know of no case of modernization and development accompanied by a stable, or a falling population. Kuznets suggests that it is better to view the economic growth of the last two hundred years, which is the main focus of his studies, as a particular case, a case which may not be applicable to the future and which certainly did not apply in preindustrial eras. This leads to a broader definition of economic growth:-

"To be applicable to a number of economic epochs, economic growth might perhaps be defined as a sustained increase in population attained without a perceptible lowering of per capita product, i.e. in combination with either stability or rise in per capita product." 2/

This leaves open the question whether a particular rate of population growth (or any rate of growth) is desirable and compatible with economic development.

The general line of argument developed in the last decade asserts that more rapid economic growth can be achieved (measured in terms of incomes per capita) if the rate of population growth can be reduced. There is nothing mandatory or automatic about the way in which this might come about; essentially what is argued is that a lower rate of population growth will permit a higher proportion of total resources to be used for purposes which promote growth in per capita incomes, rather than be used to provide the increment in population with the same level of per capita income. Following the definition of Professor A. Sauvy, investment for this latter purpose, i.e. to provide a growing population with the necessary capital stock, is usually called "demographic investment". 3/

1/ S. Kuznets, Op. Cit., page 1.

2/ S. Kuznets, Op. Cit., page 20.

3/ A. Sauvy - General Theory of Population, (Paris) 1966, pp.179-180.

Whether the resources no longer required for demographic investments are actually used for expenditures that will promote growth in per capita incomes depends upon the whole galaxy of factors determining development in a country. The basic assertion is that it will be easier for these factors to operate, if population growth rates are lower; beyond that it is necessary to spell out the hypothetical possibilities, in terms of increased savings and investments, more productive use of the capital stock and better organization of the economy. These, it should be stressed once again, are all possibilities to be exploited - not the inevitable consequences of lower rates of growth of population.

These arguments are in essence the basis for the World Bank's own position; however, they must be handled with some care, just because they might appear to conflict with the facts of history. They depend crucially upon a *ceteris paribus* assumption - that the rate of growth of population can be reduced without the benefits of such a reduction being outweighed by adverse effects upon the other elements which influence economic growth. The historical record does seem to show that there are links between growth and fertility decline (the main mechanism for the reduction in the rate of growth of population). The novelty of the newer arguments is that they provide support for attempts to reverse the apparent order of historical causality and reduce fertility as a means of promoting a rise in income per capita. Much of the contemporary discussion between economists on questions of population and development, therefore, is concerned with the possibility and validity of such a prescription. There are those who hold that even if it is valid it is purely academic, because there are no sure policy instruments with which to influence fertility. There are also those who hold that, even if the policy instruments are at hand, it is a waste of time to try and use them unless the historical conditions are favorable to such a decline. Once those conditions are established (and they are all desirable on other grounds) fertility will decline without policy intervention.

When put in the above terms we come close to the key issue that seems to have engaged all economists who have ever discussed the relationship between population and economic development:- is population change to be treated as an endogenous or as an exogenous factor? The classical economists, following Malthus and Ricardo, regarded it as being determined within the economic system, so that the size and rate of growth of population was thought of as depending upon economic factors. Once the fall in fertility and the consequent decline in the rate of growth of population became widespread and apparent in Western Europe and North America, there was a tendency to take the opposite view and regard population movements as being largely exogenous in character, influenced, but not determined by economic factors. If it becomes possible to manipulate population change by policy instruments, the latter viewpoint would be strengthened.

The Malthusian Theme

The contemporary arguments linking population growth and general economic development prospects which have been referred to above focus on short- and medium-term dynamic effects. They share a dynamic form with the older classical approach that originated with T.R. Malthus, but otherwise they have little in common with Malthusian arguments. However, one origin of the current resurgence of interest in population questions is a revival of a Malthusian pessimism about longer run population prospects. Apart from the intrinsic value of his ideas, this revival makes it worth while to look again at the influence of the man who provided the best known bridge between economists and population studies. Despite the difficulties inherent in his writings on population it is true that any discussion of population problems leads back, sooner or later, to his statement of the principles involved.

This further cycle of Malthusian pessimism follows from the continuing decline in mortality in the developing world, not yet accompanied by an equal fall in fertility. In some of the larger, poorer countries it is doubtful if fertility has fallen at all; it may even have risen. In others, the decline lags far behind the fall in mortality, so that, in either case, rates of population growth are high. The statistical evidence is deplorably bad in many cases, but there is general agreement that we are faced with a unique situation probably with no parallel in previous world history, where for very large areas of the world the rates of growth of population exceed 2 percent per annum and, in some cases, even exceed 3 percent per annum. The Malthusian pessimism that afflicts many people in the face of such a situation is reinforced by the fears engendered when such population growth is placed in an ecological context. The widespread current interest in ecology (largely in the developed countries) is not simply a particular intellectual fad; it reflects increased knowledge of the interrelationships among resource endowments, together with a humbling suspicion that we lack a full understanding of the significance of these relationships.

To follow through as to why this appears to be a Malthusian situation it is necessary to return to his doctrines. This is not an easy thing to do, because Malthus did not always make his points with perfect clarity, while many people have commented and reviewed what he wrote. However, if one seeks the intellectual link between his thinking and present day population problems, it can perhaps be found in his point of departure in seeking a "natural law" of population:

".... the first steps must be an endeavour to ascertain the natural law of population, or the rate at which mankind would increase under the fewest known obstacles," 1/

1/ T.R. Malthus - "On population", (1823) Encyclopedia Britannica, Supplement, 1924.

There are many difficulties in interpreting the concept of a "natural law" in a human situation in which there are always social and cultural factors to be considered.^{1/} For present purposes, however, these difficulties are not relevant, because the crucial question, or set of questions, raised by Malthus was not about the maximum rate of growth of population, but were concerned with the reasons why human populations do not grow at the highest possible rate.

Human populations would always grow rapidly, he argued, unless they were prevented by the well known positive and preventive checks. The positive checks were those that cut short the life of humans by increasing mortality, while the preventive checks were those that operated to reduce fertility. Malthus further categorized the latter into vice, misery and moral restraint, with the first two comprising the positive checks and moral restraint (meaning abstinence from marriage, with a strict celibacy in the period before marriage) acting as the preventive check. These categories have not proved to be very useful with the passage of time; a better division is between those checks to population growth that are within human control and those that are not.

At the time when Malthus was writing the extent to which mortality was under human control was very limited; fertility was, in principle, more controllable but the methods available were either age-old primitive methods of birth control and abortion, or late marriage and moral restraint. Malthus believed that if the preventive checks did not operate through holding down fertility, the positive checks would work very swiftly to increase mortality. One suspects that, in the early nineteenth century mortality was such that a rapid rate of growth of population was ruled out, except where the resource base was particularly favorable and immigration was possible (as in North America).

The pessimism of Malthus was based, therefore, on the limited range of possibilities for exercising control over fertility; he ruled out artificial birth control as a "vice", leaving only moral restraint. Mortality, meanwhile, was high enough to keep the rate of growth of the population in line with the resources of the economy. It was the ultimate check, but with no control over fertility at low standards of living, economic progress and prosperity never got the opportunity to get ahead of population growth and raise the general standard of living. In the words of the economic historian, H.L. Beales, "The Malthusian theory rests, at bottom, on the view that poverty and indigence are the inescapable lot of man, his natural inheritance."

^{1/} There is some evidence in the Essay on the Principles of Population that Malthus regarded a rate of growth of 2.8 percent, (doubling every 25 years), as a feasible natural rate of growth, although this rate would still be "short of the utmost power of population". (Essay, Chapter II.)

If we move forward and look at the position in the second half of the twentieth century we now see that pessimism about population stems, ironically enough, from a situation in which the Malthusian diagnosis appears to be more applicable than it was at the time at which he wrote. We do now have several countries and regions of the world in which the population is growing at rates which must approach a "natural rate", and which are capable of doubling the total population every two decades. These high rates of growth result from dramatic declines in mortality achieved by human action related to, but largely independent of the general standard of living. This mortality decline has worked in two dimensions; it has kept more people alive and it has tended to keep them alive for longer life spans. In the meantime fertility has come under better and more humane forms of control, but these possibilities have not been acted upon to the extent that is necessary to reduce the general level of fertility. Indeed, ironically, the same improvements in medicine and health facilities which have reduced mortality have also been partly responsible for raising live birth rates to levels that would have been considered impossible in the time of Malthus. The general fear of the pessimists now, therefore, is that it will only be through an inhumane reversal of the trend of mortality that the rate of growth of population will slow down.

Behind that general fear of the ultimate consequences of population growth unchecked by a decline in fertility lies the other basic assumption of Malthusian doctrine - that there are (or will be) diminishing returns to scarce resources, especially exhaustible, natural resources. If that does not apply, then apart from the strains that a rapidly growing population places upon the economic and social framework of society (which can be considerable), there is no need for ultimate pessimism.

It was this key assumption of the inevitability of diminishing returns to exhaustible resources that seemed to be least borne out by subsequent economic history in the nineteenth and the first half of the twentieth century. Technological advances in modernized economies appeared to prove that Malthus had been hopelessly wrong. The point remains, however, that Malthus did stress that the "population problem" is, in the longer run, a problem of the relationship between people and resources. We now know that it is a much more complicated question than was thought, because of our new understanding of the ecological interrelationships. We can also now see that it is not simply a question of numbers of people and their relationship with the environment, but also of the quality of life that is possible with a given size of population. The present day division between optimists and pessimists about population questions turns on the attitude towards technical progress and whether it is felt that continued technological advance will be able to counteract the imbalance that is emerging between exhaustible resources in the world and growing populations.

To sum up this very brief review of Malthusian doctrine and its possible application to present day conditions, it has been argued that we are faced with a situation that Malthus feared, but which did not materialize in his day. We now have countries with very high rates of growth of population, where it is not unrealistic to talk about population as

"exploding". These rates of growth did not materialize in the time of Malthus because the positive checks maintained high death rates. The present day Malthusian fears the return of such checks to population growth unless a decline in fertility occurs soon, either spontaneously or as a result of policy measures. Economists who are interested in population questions, therefore, are bound to be concerned, as was Malthus, with the links that may exist between socio-economic conditions and the level of fertility and mortality.

The Economic Analysis of Population

Most economic analyses involving population involve either an hypothesis about the links between economic magnitudes and demographic variables, or they purport to explain the movements of demographic variables as the objective of the economic analysis. At least, this is the case with fertility and mortality; when one comes to movements of population, or the study of migration, the approach of the economist cannot be clearly summarized, possibly because the phenomenon itself is much more difficult to define, compared with "events" as straightforward as births and deaths.

It has so far proved difficult to provide satisfactory general explanations of the links between economic variables and mortality, fertility and migration. This is one reason for the greater volume of controversy when economists turn to population studies, especially when they try to reach policy conclusions. To discuss population policy, by which is meant overt public action to influence the rate of growth of population, without general agreement as to what determines fertility and mortality, can be a dangerous business. The violence of controversy in the population field historically can probably be traced to this feature. Certainly the abusive and ideological overtones that have become attached to the word "Malthusian" stemmed largely from the policy conclusions that were drawn from his writings, both by him and by his fellow classical economists. Since the revived interest in population matters also arises partly from a desire to reach conclusions about population policies, it is not surprising that the discussions are still surrounded by controversy. Naturally enough, the controversy surrounds questions about fertility, rather than mortality:- it is easy to reach a consensus as to the desirability of reducing the incidence of death.

Perhaps the clearest case in which the importance of the hypotheses about the links between fertility, mortality, and the economic variables can be seen is that of the macro-economic analysis that has incorporated demographic changes. For example, various attempts have been made at the construction of economic-demographic models which would incorporate the interactions between demographic and economic change. The demographic part of the model works out the implications of changes in the key variables of births, deaths and the age structures as the population grows through time, while the economic part includes the usual macro-economic variables, such as incomes, saving, investment, etc. The two halves of the system are then linked by appropriate assumptions about the influence of the variables of one part of the system upon the other. The movement of the economy, and of the population, can then be simulated through time, as each reacts upon the other.

Those who are familiar with model construction (and with simulation models, in particular) will appreciate that there are many difficulties in the construction and handling of such models. They do represent a clear case, however, in which the economists can make a contribution to population studies in their own field. Much of the present economic literature about population and economic development owes much to the first of such models, constructed by an economist and demographer in 1958. ^{1/}

The construction and manipulation of such models are ideally suited to the large computers which were not available in the late 1950's and it seems clear that one can hope for further development of such models as the use of such computers becomes more widespread. There are already a number of other examples which have been constructed to reflect the circumstances of particular countries. Nevertheless, the building of such models is an expensive and time consuming business and they rapidly become unmanageable the more refinements are introduced in an attempt to replicate the reality of any particular country. Unfortunately these difficulties arise at a relatively low level of disaggregation, so that the existing models, in order to remain manageable, tend to be constructed at a very general level that undoubtedly limits the insights that can be obtained from them. To take one example, the incorporation of a sectoral breakdown is highly desirable, involving at least a separate public sector and a distinction between the agricultural sector and the rest of the economy. When this is done the results obtained are very different from those obtained with more general models without such a sectoral breakdown. However, the models that result from such disaggregation are very complex and strain even the facilities of the larger computers.

Despite its inherent difficulties the study of economic-demographic relationships should be pursued further by economists, because it deals directly with the basic issue involved in the analysis of population and economic development. This issue is the dynamic nature of the relationships - the iterations between the demographic and economic variables occur as a process through time and they cannot be understood in a static framework. The results obtained, however, depend upon the assumptions built into the models, both economic and demographic. It should be stressed, once again, that we do not yet have any firm empirical basis for the key demographic assumptions linking births and deaths to the economic variables. For the time being, these economic-demographic simulation models are only spelling out the implications of various hypotheses - they are not able to say anything about the actual operation of any particular economy.

^{1/} A.J. Coale and E.M. Hoover, Population Growth and Economic Development in Low Income Countries. (Princeton), 1958.

The second area in which economists can make a contribution - and where they have been most eager to do so - concerns cost-benefit analysis. It is not proposed to go into this topic in detail, because you have received a copy of a recent Working Paper prepared in the Economics Department of the Bank which discusses it at length.^{1/} The intention is rather to point to the broader implications of this discussion as applied to population questions. We are here dealing with questions of policy, in a welfare setting - the issue is whether it is possible to say something about the measurable effects of proposed actions upon demographic variables and compare the prospective results with the costs of achieving them. An objective must first be specified, such as a reduction in mortality or fertility; in the case of migration, it is also possible to discuss the costs and benefits of population movements that are not planned, but which take place for autonomous reasons.

Most of the attention of economists has been focussed upon the cost and benefits of programs that aim to reduce fertility directly by the provision of family planning facilities. At first sight it is strange that more attention has not been given to the costs and benefits of death control; the widespread fall in mortality throughout the developing world can be much more directly linked to public health measures of various kinds, than can the few examples of falling fertility be linked to the results of organized family planning programs. In addition it is easier to get general agreement that reductions in mortality are desirable in themselves and should be actively sought after as matters of public policy than it has been to get similar agreement about programs to control fertility. Indeed, the latter proposition is still a matter for heated debate. There is no ready answer as to why economists chose to concentrate more on the more difficult task of analyzing the costs and benefits of fertility control, other than the institutional and historical explanation that the practical possibility of low cost, large-scale family planning programs which became apparent after 1965 encouraged a concentration upon this topic.

What still seems to be lacking, however, is an agreed welfare framework in which to place all such partial analyses. The need for such a framework goes far beyond the need to deal with family planning programs - it would apply to all policies that influence or affect the level of fertility and mortality. Since these effects are often secondary to the main purpose of other policies, they are not usually taken into account. When public policy promotes the extension of educational facilities, for example, the action will be justified on its own merits, rather than upon the likely by-product effect such programs might have upon the birth rate. This is notwithstanding the almost certain possibility that if such "joint product" effects were properly taken account of, the rate of return from such educational expenditures might rise sharply, compared with benefits that would flow from the educational effects taken by themselves.

^{1/} T. King, The Measurement of the Economic Benefits from Family Planning Projects and Programs. (Economics Department Working Paper No.71) IBRD, March, 1970.

A basic welfare rationale is needed for the cost-benefit evaluation of direct measures to reduce fertility and the rate of growth of population, if an economic criterion is to enter into their justification. The need does not arise where such measures are sponsored because of other criteria, such as the notion that it is a basic human right that all should have access to the knowledge and means by which families can determine the number of children they wish to have. If, however, it is argued that a lower birth rate will reduce the rate of growth of population and that this is desirable in order to improve general economic conditions, it is necessary to have some idea as to who will gain, over what period of time and how the gains will be distributed through society. It is then necessary to have an explicit welfare objective function to give weights to the gains and losses within society and their distribution through time.

This is not a simple task because the population affected, with and without the change proposed, will be different in both size and composition. Obviously even a stable population will change its individual composition over time as births, deaths and inward and outward movements occur, so that the beneficiaries of contrived economic change and development will never be the same group of people living at the time that the actions to initiate such changes were taken. In the case of population policies, however, the principal aim of such actions is to ensure that the population will be different in size (and, inevitably also in composition) from what it would otherwise be. Does it make a difference when this is the case, rather than when it is something achieved as a by-product, or secondary effect?

It is doubtful if economists, as such, have much to contribute to a discussion about welfare functions in terms of the size and composition of human populations; as long as the length of human life is both finite and uncertain one cannot be sure of the continued existence of any one single member of the population over even a short run period; one can be sure, however, of the continued existence of the total population involved. It is probably better to discuss whether such a population is better off, or not, in terms of some economic criterion such as incomes per capita, which will incorporate the influence of population size. This limitation of interest to economic criteria can be justified on the grounds that, in the last resort, public action cannot determine the population size and its rate of growth, but can only influence the actions of individual couples whose collective decisions do determine these magnitudes. These individual decisions will clearly never be made on the basis of economic factors alone and it is for this reason that it is of doubtful value to try to establish an objective welfare function incorporating population size and its rate of growth. What can be done is for the economist to analyze the economic implications of changes in these parameters. Such a focus of interest has the additional advantage that it is equally applicable to both short- and longer-run situations, and can be used to indicate the differing effects that will follow from population changes over different time periods. 1/

1/ It is hoped that the above arguments will also allow us to avoid lengthy discussions as to whether the economist should take account, in cost-benefit analysis, of the welfare "losses" of those who are not born - this seems to be more a topic for theology than for economics.

Finally, I would like to turn to one other area of great topical interest in current population studies and ask what contribution the economist can make to its development. This area is that concerned with the establishment and operation of family planning programs. These programs, which can be publicly or privately operated, aim to provide information, equipment and services to parents who wish to practice family planning. Insofar as medical facilities are involved they have many of the characteristics of other public health programs; in other respects, especially where information and motivational objectives are concerned they can differ sharply from traditional health services. Most of the interest focussed on such programs has been directed to the analysis of the effects of the programs, especially the likely effects upon the demographic variables, particularly fertility.

This turns out to be a complex and difficult question, requiring rather detailed demographic data. However, it is not an economic problem, but rather one for demographers, sociologists and, possibly, systems analysts. Similarly, the equally fascinating questions that arise about the effectiveness of such programs in reaching their objectives relate more to the field of management studies; here we get closer to economic issues, however, because these questions involve the allocation of resources within the program to achieve different ends.

It is suggested that one economic aspect of these programs which has not received sufficient attention is the manner in which they should be viewed from the point of view of public finance. The provision of free, or subsidized, family planning services by the public sector involves questions such as the distribution of the resultant tax burden in relation to the distribution of the benefits, criteria for the pricing of services (including the question whether the price should be zero, or not) and the application of cost-benefit techniques to aid in decisions about the scale of operations of the program. As presently operated in several developing countries it is likely that public family planning programs have an element of income redistribution built into them; they are based upon the provision of services to the poorer classes of society and financed largely out of tax revenues. The successful use of such services necessarily raises incomes per family member above what they would otherwise have been with a larger family size.

One interesting feature of all such programs so far has been their relatively small cost, by comparison with the rest of public sector expenditures. It is too early to assume that this will always be so, but the evidence of the more successful programs encourages one to think that even a very large national program will not represent more than 1 to 2 percent of GNP, or more than 5 percent of a national budget. If this proves to be generally the case, perhaps one need not pay much attention to the direct public finance effects of such programs. However, this would still leave open the question whether family planning programs should not be viewed in a complementary relationship to other public expenditures; sometimes directly, as with other medical services, but also indirectly. A family planning program that was successful in reducing fertility would have an impact on virtually all other government programs where the level of services depended in any way upon the size and structure of the population.

These, and many other questions arise once family planning programs are viewed as avenues for public expenditures and competitors for limited public funds with other programs. Those who were most influential in the development of family planning programs in the last five years were not economists - they were mainly sociologists, but they happened, fortunately, to be particularly interested in designing programs so that their progress could be properly, and continuously evaluated. This requires the collection of the right data and making sure that the information is constantly available to the management of the program. These are features which are noticeably lacking from many, older and more traditional public expenditure programs. In these respects the newcomer may have much to teach those already in the field.

Conclusions

This paper has been largely concerned with discussing the contribution that economists might make to the study of population questions. The discussion has been limited to those topics - the macro-analysis of economic growth, costs/benefit applications and the economic aspects of national family planning programs, which are linked to fertility and mortality. The third major topic of population studies - migration - has received only cursory mention. This is not because it is not important, rather the reverse. Its significance calls for a more extended treatment than is possible in a paper of this length.

The topics discussed are those which are of current interest and the subject of continuing controversy. It was pointed out that one important aspect has been surprisingly neglected, which is the analysis of the costs and benefits of measures which influence mortality. All of these areas are concerned with short- or medium-run effects. It is important that these aspects be studied, because this is the time period within which public policies are decided. It was also pointed out that the major concern about population questions arises from the long run relationship between people and limited resources.

As is so often the case in economics the essence of the problem is the passage of time and its treatment in analysis. Perhaps this is one of the more important contributions that economists can make - to apply our methods of dealing with time to this topic. The full consequences of changes in fertility and mortality emerge only in the longer run; however, the determinants of such changes (and the opportunities for influencing them by policy) are short-run phenomenon. The task of the economist, therefore, is to straddle the short and long run, not getting lost in the prophecies of doom, but setting out the economic-demographic relationships operating in the short and medium run that may save us from the Malthusian nightmare..