Controlling the size or growth rate of a population is potentially one of the most powerful forms of government intervention in the lives of its citizens. Yet, there is no systematic discussion in the literature of the welfare-economics justification for population control. Most people take it for granted that an "overpopulated," underdeveloped country is justified in taking measures to control population growth. Methodical analyses of the static and even dynamic concepts of optimal population are available (e.g., Cannan, 1888; Meade, 1955; Dasgupta, 1969; Pitchford, 1974; Dasgupta and Mitra, 1982). But whether the concept of optimal population justifies population control has not been adequately explored. If the existing population exceeds the optimal, it may be thought that population control is justified, but such reasoning fails to consider why the optimizing behavior of individuals is not adequate to take account of the situation, requiring instead government intervention.

Defining population control as an attempt to reduce population size or its growth by decreasing the number of births, this paper examines the arguments advanced for such control and refutes them. The successive steps are set forth concisely in the remainder of this section and elaborated in the sections that follow.

According to welfare economics, the circumstance that current population size is well beyond the point that maximizes per capita product is not a valid ground for attempting to limit population size or growth, because (1) the newly born may receive no more than their marginal products; (2) people have preferences with respect to family sizes; (3) average utility may not be an ethically acceptable maximand since it ignores the welfare of prospective individuals.
The existence of substantial external costs of additional births has been adduced to justify limiting population growth. However, major sources of possible external costs can be shown to justify efficient pricing (including taxes) to account for the externalities rather than efforts to limit population size or growth.\textsuperscript{2} The existence of these costs may justify charging people who wish to have additional children for the associated medical and educational expenditures plus, perhaps, a little extra for congestion costs; they do not justify such measures as the one-child policy currently in effect in China. It is often argued that it is not feasible to use taxes and subsidies to regulate population growth because family sizes are not price responsive. This argument misses the point that, in the absence of ignorance, family sizes and population growth rates, even if high, are not excessive provided external costs are internalized by taxes and charges. A similar case can be made with respect to pollution. Provided that the full costs of pollution (say in the production of a good, $X$) are included in the corrective tax, the resulting production level of $X$ is optimal even if it is not much lower than before due to the fact that the demand for $X$ is price inelastic.

Some popular arguments in favor of population control, such as the limitation of resources, the low-level equilibrium population trap, and the isolation paradox, can also be shown to be invalid unless strong externalities and/or ignorance are involved.

The external benefits of having more people include the positive welfare enjoyed by these additional people, economies of scale in the provision of public goods, a wider range of choice of friends, marriages, lifestyles, residency, and so on, and a faster rate of advance in knowledge.

Population growth of course has many other effects (see McNicoll, 1984, for an overview) whose ultimate impact on social welfare is unclear. In this sense, we cannot be certain whether population growth will be beneficial or otherwise. Nevertheless, we have to proceed with the best knowledge available. Unless we have sufficient reason to believe that the little-known effects of population growth are likely to be either detrimental or beneficial, we should proceed on the assumption that they are neutral, in accordance with the generalized theory of the third best (Ng, 1977, 1985b), since this is likely to maximize the expected value of our objective function.

My motivation for writing this paper was to seek some justification in welfare economics for China’s drastic one-child policy. After examining the issue, I have concluded that welfare economics offers little justification for policies to limit population growth. Moreover, there would seem to be ample grounds for encouraging population growth for many countries (including Australia, Canada, England, France, and the United States) with very low rates of population growth.\textsuperscript{3} Even for less developed countries, moderate population growth appears to be desirable from a narrow economic point of view, that is, even if one disregards parental preference for children that reflects non-economic considerations. Underdevelopment is often a question of bad government and a bad economic system, but seldom one of high population growth.
as such. The sudden jump in per capita agricultural output following introduction of the household responsibility system in China, despite the country’s one billion-plus inhabitants, is only a recent proof of this proposition.

Those who find the argument of this paper extreme should be reminded that its implications are by no means novel or idiosyncratic: note, for example, the value attached in traditional religious teachings to maximizing the number of redeemed souls.

**Optimal population and population control**

The classical theory of optimal population (Cannan, 1888; Carr-Saunders, 1931) is based on the maximization of per capita production, consumption, or utility (the three being maximized at the same level of population in the simple static model with no preference for population density or family size). As illustrated in Figure 1, optimal population according to this classical criterion is at $P_{a}^*$. If the existing population is higher than $P_{a}^*$, surely population control is justified? A number of considerations should be taken into account before answering this question.

First, people derive utility not just from income but also from having children. If a family is willing to reduce its per capita income by increasing its size, why should it not be allowed to do so without government intervention, unless such questions as ignorance (especially regarding birth control) and/or externalities (to be discussed below) are involved? It may be true that the free choice of family size involves a steady decline in (or failure to increase) per capita income, but, in the absence of ignorance and externalities, if families decide to have this time profile of family size and per capita income, why should they not be allowed to so choose? Unless there is parental negligence.

**FIGURE 1** Average and marginal product curves showing classical optimal population

![Diagram](image-url)
government does not intervene in family affairs between parents and children, so why intervene in matters of family size?

Second, even abstracting from preference for children, the objective of maximizing per capita (or average) utility is subject to debate. Meade (1955) proposed the alternative criterion of maximizing total utility, that is, average utility times population (this criterion has been traced to Landry, 1934). With this alternative criterion, the level of optimal population $P_t^*$ is obviously higher than $P_a^*$ and depends not only on the average product curve but also on the utility function (of average product). It is quite possible that $P_t^*$ is much higher than $P_a^*$. The fact that the existing population is much larger than $P_a^*$ need not then justify population control unless average, instead of total utility is accepted as the maximand.

Economists (in fact, philosophers as well) are divided, however, between the two criteria. For example, Dasgupta (1969) and Friedman (1981) are persuaded by the Meade criterion of maximizing total utility. Nevertheless, most, if not all economists seem to hold that, while we cannot kill off a segment of the existing population in order to maximize the average utility of the rest, there is no point in increasing population size beyond the point of maximum average utility, since unborn people have no moral claims and have no "right" to exist (Harsanyi, in Ng, 1983, p. 167). The view that unborn people have no rights can be effectively countered by the following argument.

**Can unborn people be ignored?**

Because we are discussing the acceptability of a criterion at a general level, arguments based on hypothetical examples (even if irrelevant in practical terms) are methodologically acceptable.

Suppose that the question of old-age support has already been solved by automation or other means, so that a society of exclusively old people is feasible. Suppose also that every family marginally prefers having no children to having children and either does not care about the continuation of mankind or does not care enough to balance its preference for no children. Then the utility of the present generation is maximized by letting mankind become extinct within one generation. Since the disappearance (or nonappearance) of mankind applies only to the future and to unborn generations, those who believe that unborn people have no rights must sanction the alternative of letting mankind become extinct, even if the alternative of perpetual regeneration were achievable at only a small cost to the present generation, and even if future generations will enjoy high levels of welfare.

It seems clear to me that, to avoid the extinction alternative, we must take the welfare of prospective individuals into account. Prospective individuals are those who may be born in the future under one alternative but may not be born under another. That these people are yet unborn does not destroy their claim to be taken into account in a policy choice that may decide their existence or otherwise.
The nonacceptability of maximizing utility per head

For a society of a given population of, say, one million individuals, consider the following alternatives:

A One thousand individuals enjoy a utility level of one million units each, and all other individuals enjoy no utility (positive or negative).
B All one million individuals enjoy a utility level of one thousand units each.
C All one million individuals enjoy a utility level of 1,001 units each.
D All one million individuals enjoy a utility level of 900,000 units each.

Most people regard B as better or at least as no worse than A. Alternative C (and a fortiori D), being strictly better than B, must be better than A. Although one thousand individuals suffer a huge loss in utility (in moving from A to C), the gain to the rest of the society more than offsets it.

There seem to be few, if any, valid grounds for not extending the above judgment that C and D are superior to A to the issue of optimal population. Since the utility of an unborn (or prospective) person must be regarded as equal to zero (as he can feel neither pain nor pleasure), and since the welfare of prospective persons cannot be ignored (otherwise we cannot solve the extinction paradox discussed above), the comparable alternatives in population choice to A, B, C, and D are as follows:

A’ A society of one thousand individuals, each enjoying a utility level of one million units.
B’ A society of one million individuals, each enjoying a utility level of one thousand units.
C’ A society of one million individuals, each enjoying a utility level of 1,001 units.
D’ A society of one million individuals, each enjoying a utility level of 900,000 units.

Just as most people prefer C or D over A, so they should also prefer C’ or D’ over A’, despite the fact that A’ has the highest average utility (utility per head). The unacceptability of maximizing average utility in the choice of population size is that the average is calculated over only the existing population in a given alternative, thus ignoring the utility of prospective individuals. For example, in comparing the average utility of A’ and D’, the 999,000 individuals who would exist and enjoy a high level of utility in D’ are completely ignored in the calculation of the average utility of A’. If we are comparing alternative policies affecting only the same set of individuals (e.g., the one thousand in
A’), it is quite logical to ignore other unaffected and unborn individuals. Similarly, in the choice between A’ and D’, the prospective second million individuals who would exist in another alternative E but who do not exist in either A’ or D’ may logically be ignored. But in the choice between A’ and D’, the prospective individuals who would exist in society D’ but not in A’ should not be ignored. The maximization of average utility seems quite reasonable, provided the average is over all relevant individuals, including prospective individuals. For example, the average utility of A’, in a choice between A’ and D’, should be taken as \( (1,000,000 \times 1,000 + 0 \times 999,000) / 1,000,000 = 1,000 \), which is much smaller than the average utility of 900,000 in D’.

Of course, the maximization of this comparable average utility coincides with the maximization of total utility (sum of utility over all relevant individuals).

The ethical unacceptability of maximizing (noncomparable) average utility can be seen by the following comparison. Consider the alternatives:

A. Ten individuals, each with 100 utils. B. The same ten individuals, each with 100 utils as in A plus another five individuals, each with 90 utils.

Comparing B to A, the same ten individuals enjoy exactly the same utility levels in both situations, while five more individuals have the benefits of enjoying a reasonably happy life in B but not in A. They prefer to be born rather than not. The ten individuals have no objection whatsoever to the appearance of the five additional persons. I can only conclude that B is better than A. Comparing C to B, we find that C is better than B according to either maximization of the average or total utility (or in fact according to some other consideration, such as equality). So C must be better than B from transitivity of strict preference. But C has a smaller (noncomparable) average utility.

Some people may object that B need not be better than A since B involves some inequality. In reply to this, first note that we need not have inequality in income distribution in B; the five additional persons could just be slightly less joyful individuals. And since A, B, C are presented for ultimate choice, no question of the effect on the future arises. If it does, it should have been specified in the relevant alternative. It is thus compelling for B to be regarded as better than A. Nevertheless, for those who may have an inherent preference for equality as such, over and above its contribution to welfare, consider the following alternatives:

D. Four individuals, each with 100 utils plus another four individuals, each with 25 utils.

E. The same eight individuals as above (i.e., four with 100 utils each and another four with 25 utils each), plus another ten individuals, each with 58 utils.
In comparison to $M$, $N$ has ten additional quite happy individuals (each with 58 utils) and also has a more equal overall distribution of utility. It is difficult, especially for people with egalitarian ethics (for whom this comparison is designed), not to prefer $N$ over $M$. But $N$ has a lower average utility (60 utils) than $M$ (62.5 utils).

I hope that most readers have been persuaded that maximizing (non-comparable) average utility is not an acceptable criterion for optimal population. The fact that a given population size is higher than the level that maximizes average utility thus is not an acceptable ground for population control.

**External costs of a larger population**

Unless there exist significant external costs or benefits, population control is difficult to justify since the optimizing behavior of individuals (in determining family size in particular) should then bring about the optimal size of population. This follows from the basic theorems of welfare economics, which show that a Pareto optimal situation is achieved by individual optimization coordinated by the market mechanism, satisfying certain conditions (mainly the absence of externalities, monopolistic power, and ignorance). On the issue of population, all individuals (or families, rather) are atomistic and no question of monopolistic power exists. However, many couples (especially the less educated in the less developed countries) may be ignorant of the opportunity for birth control. Thus, the provision of information, education, and access to birth control methods may well be justified. But stronger measures of population control cannot be justified on the ground of ignorance. This leaves us with externality as a possible ground.

**Pareto optimality of laissez-faire**

In the absence of ignorance and external costs (including the external costs of parents’ choices on the welfare of their children), whenever a family decides to have another child, this additional member is expected to increase the happiness of the family and also to enjoy a happy life (or at worst not an unhappy one, otherwise an external cost is present). Of course, in the real world of uncertainty, not all decisions turn out as expected. But unless a systematic bias is present (due to ignorance), a decision to have a new member should on average turn out to be welfare-improving both for the existing family and for the new member.

If the new member is bestowed with an inheritance, this is the preference of his parents. The inheritance received by his brothers and sisters may thereby be reduced. In fact, some existing family member may be made worse off not only financially but also in other ways. However, if the family (or the parents) decides to have the new member anyway, the society must accept this decision (unless it imposes its will on other members of the society or there is criminal parental negligence). The intrafamily conflict presumably has to be settled by
the family itself. Before making a decision, good parents will weigh the utility loss (if any) imposed on existing members against the utility gain.

If there is no major distortion in the factor market, the new member (when grown up) will receive the value of his marginal product (VMP), in addition to any inheritance, as discussed above. If he is going to lead a happy life with his VMP and his inheritance, and if he imposes no net external costs on the society, then his birth is obviously a Pareto improvement (ignoring any possible conflict within his family of birth) since no family is made worse off, his family of birth is made better off, and he is happy. This is true even if the marginal product is well below the average product, such as the point $P^1$ in Figure 1. Thus, despite the fact that the average product is falling and the existing population is well over the level ($P_a^*$) that maximizes the average product, it may still be Pareto optimal to have more people.

The indirect external cost of subsidies

When more people are born and their VMPs are low, however, the society may decide to make the distribution of income more nearly equal by, say, subsidizing education or subsidizing low-income families with many children. When such subsidies exist, the decision to have more children may be said to impose an indirect external cost on the society. Can the existence of such indirect external costs justify population control? First, this factor cannot justify sanctions against those people whose birth brought about the subsidies. This is so because the parents of these people decided to have them even in the absence of the subsidies. Their births are thus Pareto optimal as argued above. The fact that the society chooses to pay the subsidies after their births should not be used against them. To see this point more clearly, consider the following alternatives:

I No additional births.

II Additional births chosen by parents in the absence of external costs and in the absence of subsidies (including the expectation of their introduction).

III Additional births plus subsidies.

We have shown above that II is a Pareto improvement over I. The society decides that III is an overall social improvement over II (mainly on distributional grounds). So III must be better than I from transitivity, although III is not a Pareto improvement over I.

Nevertheless, after the introduction of subsidies, decisions to have more children will not necessarily be Pareto optimal. However, there are offsetting considerations. First, the subsidies have to be financed, presumably from increased taxation. In the long run, this increase in taxation will fall on the new generations themselves. Presumably, large families with low incomes will receive net subsidies, while small families with high incomes will pay higher taxes because of the subsidies. Thus, at least for those who expect their children
to bear a higher tax burden, there is some offsetting effect on the distortion of the choice of family size created by subsidies.

Second, if the marginal births induced by the subsidies bring forth people who would have been happy even without the subsidies, then these additional births are still desirable on the ground of a Pareto improvement and comparisons between alternatives I, II, III above. Now, subsidies for education, family allowances, and so forth are more substantial in well-to-do economies. And in such economies, it is more likely that the additional births induced by the subsidies will bring forth people who would have been happy even without the subsidies. This is so because VMP of labor is high and because most parents in these economies decide to have a child only if they expect to be able to support him quite comfortably, perhaps not so much for the welfare of the child as for their own happiness. On the other hand, in less well-to-do economies, educational and family subsidies are less substantial, even in a relative sense. Hence, in either case, the argument of indirect externality created by subsidies is unlikely to provide a strong justification for population control, with some possible exceptions. Even in these exceptions, sanctions cannot be justified against those who are willing to have more children without the subsidies.

**Congestion of common resources**

Common resources such as beaches and free parklands that are collectively owned are usually available to all members of the community free of charge. If they are heavily congested, an increase in population imposes congestion costs on the present population. This externality is due to the failure to impose suitable congestion charges on these resources and facilities. Instead of justifying population control, this situation justifies efficient pricing of scarce resources. It may be argued that the transaction costs of pricing these resources outweigh the benefits of increased efficiency in their utilization. If this is true, the externality involved is unlikely to be significant enough to justify the more drastic measure of population control, which not only involves transaction costs of its own, but also limits the choice of individual families and denies the birth of potentially happy individuals.

Furthermore, for those public goods like defense, education, and roads that are provided out of general or specific taxation, even though they may not be charged for specific usage, their use will not be free to newly born individuals as these individuals will have to pay their share of taxation. Unless their share of taxes falls below the congestion costs they impose, no external cost is involved. The external cost, if any, is unlikely to be large, since some of the more important public goods (e.g., defense, broadcasting, research) are not subject to congestion. An increase in population size allows the per capita cost of providing these public goods to be lowered. Even if an increase in population imposes net congestion, existing people may gain from the economies of scale in the provision of public goods. Unless congestion costs are huge, there is no justification for population control. And even if congestion
costs really are huge, some form of pricing to achieve efficiency should be feasible in most cases. For example, it may not be feasible to tax road usage directly, but registration fees and taxes on fuels can be designed to take account of congestion and pollution.

In countries where the means of production (land and accumulated capital) mainly are not privately owned, there is greater scope for the existence of externalities. If the publicly owned means of production are more-or-less shared equally (or in a given pattern giving a positive share to new individuals), an increase in population decreases the share enjoyed by the existing population. The share enjoyed by the new members is mainly in the form of subsidized education and free public goods. The public ownership of the means of production allows some profits to be made by public enterprises that can be used to subsidize education, family allowances, and so forth before requiring taxation. So, the only qualification to the argument of the preceding two paragraphs is in terms of the possible quantitative significance of the excess of congestion costs over tax share. Due to the low level of efficiency in public enterprises (and hence low profitability), this quantitative qualification is likely to be small.

Unemployment

If there exists significant unemployment (due for example to minimum-wage legislation), an additional worker may generate very low marginal product from the social point of view but face significant expected wages (wages times the probability of employment). Each additional person may impose an external cost by reducing the probability of employment faced by others. This externality is created by the unemployment-causing factors such as minimum-wage legislation. Rather than justifying population control, this would seem to justify the dismantling of distortion-creating legislation (leaving equality to be sought by less distorting methods).

As long as we wish to make people’s income higher than the VMP of their factor endowment, some distortion is likely to be involved both in the revenue and subsidy processes and in the decisions with respect to family size (as was noted in the discussion of the indirect cost of subsidies, above). The distortion involved, however, may be less than that introduced by minimum-wage legislation, since unemployment may significantly reduce the social marginal product of labor.

In extreme presentations of the argument that additions to the population entail external costs, the number of jobs is assumed to be invariant with respect to the size of population or number of workers, and the unemployed are assumed to have zero marginal product. These two extreme assumptions exaggerate the externality imposed by additional people on existing people. If every family has one child, we have full employment. This does not mean that, if every family has two children, unemployment will be 50 percent, even if minimum wages are unchanged. The population size of many countries has grown several hundred percent over the past century, but rates of unemployment have fluc-
tuated rather than exploded. A larger economy generates a higher demand for labor. In fact, rigorous studies (e.g., Withers and Pope, 1985) on the effects of immigration on employment show no effect—that is, the employment-generating effects balance the job-filling effects.

**Threat to international peace?**

If people in economically advanced countries choose to have smaller families and a high rate of growth in per capita income, and those in less developed countries choose to have big families (and a resulting low rate of growth in per capita income), international disparities in income and population size will grow over time. This may lead to a less stable international situation. If wars are more likely to occur, an externality may be said to exist. This is a potentially important, but debatable, point. Aggressor countries (e.g., Germany and Japan in World War II) are usually countries that have the technical and military sophistication to engage in aggression; seldom are they heavily populated, poor countries. The world’s very heavily populated, poor countries, China and India, for example, have seldom invaded other countries and do not seem to pose a threat to advanced countries. In any case, no country justifies its population control on the grounds of externalities it imposes on other countries.

**Parental negligence**

If a couple decides to have another child even if that child is expected to lead an unhappy life, their decision may be said to involve an external cost (on the unhappy child). Even if the child will be mildly happy, if his presence reduces the happiness of other family members significantly, an external cost (on the brothers and sisters) may still be present.

This externality, while possible, is unlikely to be significant. It may be true that many parents in less developed countries have children even if they will be unhappy and will reduce the total happiness of the families concerned. But this is due mainly to ignorance of birth control, not to a deliberate decision to have these children. It is conceivable that parents may be made happier by having another unhappy child, but this is not very likely. First, parents care about the welfare of their children: if their children are unhappy, they become unhappy. This is largely determined by our genes since uncaring parents are unlikely to produce healthy children who are brought up to have their own offspring. Second, unhappy children tend to make other members of the family (including the parents) unhappy even if the parents do not care about their welfare, for obvious reasons.

Third, most happiness surveys indicate that even people in very poor countries are, on the whole, happy. Poor people adjust to their poor living standard and manage to derive happiness out of life except in special circumstances, such as the Cultural Revolution in China, when the enormous strain imposed upon individuals and families by social turmoil is both abnormal and impossible to adjust to fully. This is not to say that economic growth does not contribute to welfare, only to say that very poor but well-adjusted people are
on the whole happy. Most would prefer to have been born than not. Few commit suicide (again excepting extremely abnormal situations).

**Big versus small families**

There is a possible type of external cost of large families that seems to be largely ignored in the literature on the economics of population. From my personal experience in the countryside of China (from talks with relatives and friends), I understand that one of the important reasons people in rural areas want to have many children, especially sons, is that more sons mean more fists; a big family with many big boys is less likely to be bullied. If the extra fists are used not just in safeguarding the security of the family, but also in threatening others, an external cost may be involved. Obviously, the correct way to redress this externality is to raise the level of law and order. Before this could be achieved, the external costs involved could be used only as an argument for limiting the size of families that are already big—say those with at least two sons. It could hardly be used to justify the policy of one child per family practiced currently in China. Moreover, it could be argued that any society that is unable to raise the level of law and order is unlikely to be able to enforce a control on family size. The resources used for population control could be better employed to raise the level of law and order.

**Some invalid arguments for population control**

In the previous section, we noted that popular ignorance may justify governmental provision of information relating to birth control, but that efforts to limit population size have to be justified on stronger grounds. Externality is one possible ground; but, after examining a number of possible sources of externality, we argued that they are not significant enough quantitatively or they merely justify the dismantling of some distortive measures or the introduction of efficient pricing rather than the control of population growth. In this section, we examine some popular arguments for population control and conclude that they are invalid unless combined with ignorance or externality.

**Limited resources and reduction in per capita income**

Population control is most frequently justified on the ground that increases in population will cause a severe strain on a nation’s limited resources and lead to a reduction (at least in the rate of growth) in per capita income. As argued above, a reduction in per capita income does not imply a reduction in per capita utility. In the very short run, of course, the birth of a baby immediately reduces the per capita income of the family and of the nation. However, as forcefully asked by P. T. Bauer (1981, p. 47), “do the parents feel worse off? Would they feel better off if they could have no children or if some of them
died?” Furthermore, the maximization of per capita utility is not necessarily an acceptable objective function, and the presumption that population growth reduces per capita income need not be true.

In the long run, due to economies of scale and technical advance, population growth does not seem to hinder increases in per capita income. At present, densely populated areas like Hong Kong enjoy very high rates of economic growth. “Conversely,” according to Bauer, “many millions of extremely backward people live in sparsely populated regions amidst cultivable land. Examples include . . . Sumatra, Borneo, Central Africa and the interior of South America” (1981, p. 44). Studies by Julian Simon lead to the conclusion that, in the longer run, “per capita income is likely to be higher with a growing population than with a stationary one, both in more-developed and less-developed countries” (Simon, 1981, p. 6; see also Simon, 1977). Also, as claimed by Simon and Gobin (1980), “[h]igher population density implies faster economic growth in LDCs; this . . . suggests that in the long run population growth has a positive effect upon per-capita income” (pp. 226–227). Even if it were true that the population growth of a certain country is so high as to reduce its per capita income, our argument above indicates that there can be no ground for population control unless ignorance or externalities are involved.

The low-level equilibrium population trap

The concept of the low-level equilibrium population trap is familiar to development economists. The basic idea is that the rate of population growth first increases with per capita income (due to the lowering of the death rate and the increase in the birth rate) before it levels off or even decreases with further gains in per capita income, as illustrated in Figure 2. The rate of growth in national income also increases with per capita income as a higher per capita income allows more capital accumulation (including human capital) per capita. If the two curves intersect at two points in the way shown in Figure 2 (ignore the broken curve), the lower intersection, E, is an equilibrium trap. Any shock

---

**FIGURE 2** Low-level equilibrium trap

[Diagram of the low-level equilibrium trap with axes labeled Per capita income and Rate of increase, showing two curves intersecting at point E.]
that lowers the per capita income below \( E \) decreases the growth rate of population by more than the growth rate of national income, leading to an increase back to \( E \) in the long run. Any shock that increases the per capita income above \( E \) (but below \( T \)) increases the growth rate of population by more than the growth rate of national income, also leading back to \( E \) in the long run. An economy with a low per capita income may thus be trapped at the low-level equilibrium point \( E \).

The theory of a low-level equilibrium population trap seems to provide strong support for population control. If, through such control, rates of population growth could be reduced to, say, the level of the broken curve in Figure 2, per capita income would grow indefinitely. Moreover, after an initial reduction in its growth rate, population would also increase and eventually surpass the level attained without population control (i.e., staying in the trap), provided that the height of the broken curve, at higher per capita income, remains above point \( E \). Thus, after an initial transitional period, we have the best of everything. Unless the social rate of time preference is very high, it seems irrational not to choose population control.

It may be true that controlled population growth is preferable to the trap. But a superior solution that avoids the trap is to raise the income growth curve through higher accumulation rather than through forced population control. If the choice to have one additional child does not significantly impinge on the welfare of others without external costs, people should not be forced, nor even encouraged to forgo having additional children. If it is desirable to help future generations, it is better to do so by transferring general resources through accumulation than through distortion of people’s choice now. A policy of forced savings is better than population control (unless ignorance or external costs are involved) since the former involves transfer of general purchasing power (or resources) at only the costs of administration and those of the net (of income effects) disincentive of taxation, while population control (or any other specific distortion of individual preferences) involves distortive costs on top of the administrative and disincentive costs. (See Ng, 1984, for the details of this argument.)

It may be thought that no disincentive is involved in a policy of population control that is applied to rich and poor alike. This is not really true since the same policy (e.g., one calling for no more than \( x \) children per family) will be regarded as resulting in a greater economic loss by the rich. So income-neutral controls are more akin to proportional taxes (which have some disincentive effects) than to lump-sum taxes. Nevertheless, the disincentive effects of income-neutral population controls may be less than those of the accumulation through progressive taxation. However, income-neutral population control is inferior to forced accumulation of savings through proportionate taxation. If accumulation through progressive taxation is preferable to accumulation through proportionate taxation because of equity considerations, it must also be better than income-neutral population control, taking both equity and efficiency into account.
The “isolation paradox”

This so-called paradox is used by the World Development Report 1984 as the major justification for public policy to restrict population growth:

In a small village in Asia or Africa a father of two sons and a daughter dreams of having two or three more children. He believes that enough land might be available for each of his sons. . . . Other families, particularly those with few children, seem barely able to use the land they have; at the right price, he could buy patches of it from them. . . .

This is not just one man’s plan. It is shared by almost every man in the village. Some may succeed; the majority will not, simply because the amount of land in the village is limited. . . . The pursuit of private gain can make most people worse off. One term for this phenomenon is the isolation paradox. Individuals in isolation act to the detriment of each other. . . . If parents had their way, many of them would wish to limit the fertility of others; if children had their way, many of them would wish to limit their own parents’ fertility. (World Bank, 1984, p. 55)

Using the same logic, one could tell the following story: “A small firm plans to increase its profit by increasing output. This plan is shared by almost every firm in the industry. The price of the product collapses, causing all firms to run into the red. If they had their way, all firms would wish to limit the output levels of others.” Although we have the same isolation paradox here, this circumstance does not make the restriction of competitive output socially optimal unless external costs are involved. Despite the isolation paradox, competitive firms do not run into the red most of the time. Each firm has to estimate the likely response of the whole industry (e.g., in response to a fall in costs) before deciding on its expansion plans. Similarly, a father has to estimate the future cost of land in planning his family expansion. The reason for the problem illustrated in the World Bank example above is the ignorance of the villagers. If this is the crux of the problem, providing the villagers with the relevant information (e.g., at the present population growth rate, the land/labor ratio will be halved in x years, and land prices are likely to increase by y) will suffice to solve the problem.

The problem of “external effects of population growth” discussed by John Pitchford (1985) can be seen in a similar light: “A family can be expected to realize that their decision to have an additional child is not going to affect the income that child will later receive. Yet all families facing the same choices and constraints and making such decisions will produce a rise in the population above what it would otherwise have been, which will force down future output per head, income, and wages below what they otherwise would have been, that is below the level the rational planning family expected” (p. 265).

Nevertheless, as Pitchford himself recognizes, “it is the possible failure of the individual family to perceive the demographic trends in the economy and their consequences which may result in too many children in the decreasing
The Welfare Economics of Population Control

scale returns case” (p. 278). Thus, the problem is clearly one of misinformation or incorrect foresight, not one of externalities. It is misleading, however, for Pitchford to say that the problem is similar to that of road “congestion externality” (p. 265). In the case of road congestion, even if each driver (including potential entrants onto the road) knows exactly what is happening and what will happen after his entrance, social and private costs (and hence optimal usages) still diverge due to the congestion externality. For the case of population, however, if workers are paid their marginal products, no externality exists.

In the absence of ignorance and externalities, isolation creates no problems and creates no paradoxes.

Some external benefits of more births

Since man is a social animal, each of us exerts both external costs and benefits on others. For example, my laughter is regarded by some people as amusing and by some as annoying. Similarly, children may adversely affect neighbors with their cries and pranks, but also provide amusement and company to relatives, friends, and neighbors. If such external costs and benefits are negligible or largely mutually offsetting (with costs roughly counterbalancing benefits), they may be ignored. We have argued that there do not exist external costs significant enough to justify population control, especially if the right policies for dealing with externalities, inequality, and so forth are followed. Let us now examine the major external benefits of a growing population.

In deciding whether to have another child, a family is likely to proceed only if the effect on the welfare of existing family members is positive. If it is expected that the new child will, on balance, enjoy positive welfare, an external benefit to the child himself may be said to be involved in the decision. In the absence of ignorance and other externalities, if the family itself is indifferent between having the additional child and not having him, then the birth will be socially beneficial. Assuming positive welfare, the child himself would prefer to be born, the family is indifferent, no one else is hurt. This must be accepted as a (perhaps extended) Pareto optimal improvement.

Some people believe that the (positive) welfare of as yet unborn persons should not be taken into account. But most people believe that it is bad to create unhappy persons. The asymmetry is difficult to accept. Moreover, the extinction paradox discussed above in the form of the question “Can unborn people be ignored?” shows that failing to take account of the positive welfare of prospective persons is unacceptable. Besides economies of scale in production and in defense, the positive welfare of prospective persons should be the major reason justifying the policy of encouraging population growth in certain countries with negative population growth rates.

What about the effects of more births on the rest of the community? These effects are likely to be positive if adequate measures are taken to address
major external costs. First, more people reduce the per capita cost share of each in the provision of noncongested public goods (such as defense, research, and broadcasting), as already remarked above. The counter-argument that more people reduce per capita income is invalid if the additional people receive only their marginal products.

Second, having more people provides more companionship and a larger range of choice of friends, partners, and marriages. It also provides a larger range of choice of places of residence and lifestyles. That more people also create external costs (e.g., congestion, pollution) is not a valid counter-argument if appropriate measures (e.g., congestion and pollution taxes on fuel consumption) have been taken to tackle these external costs.

A question arises as to the asymmetry of external costs and benefits. Why do I advocate taxes on external costs to internalize the externalities but not subsidies on external benefits? The reason is that most external benefits involved here are what I call nonamenable externalities. These usually involve noneconomic activities such as social interaction that change their character once taxes/subsidies are introduced. Thus, if my neighbor and/or I were paid a subsidy to be friendly to each other, I would no longer enjoy spontaneous friendship. Worse, we might avoid chatting with each other to avoid being suspected of seeking such a subsidy. (For a more detailed analysis of nonamenable externalities, see Ng, 1975.)

Third, as long as certain minimum nutritional and educational standards are met, the existence of more people increases the probabilities of society’s producing another Aristotle, Beethoven, Copernicus, Darwin, Einstein, Franklin, Goethe. It is true that if we pay our scientists, composers, poets, and writers their respective average marginal productivities, no externalities are involved. A Nobel Prize–winning scientist may contribute many times more than his income. This implies, however, that there are many other scientists who receive more than their marginal products. On average (which is what we can expect from having nonselective births), no externalities are involved. Nevertheless, it is unlikely that scientists, poets, and others are paid their marginal products on average, at least not from a global and historical perspective. Great contributions are usually beneficial to the whole of mankind for a long time. Politicians, pressed to economize on expenditures, are likely to take a national and short-term perspective. Many academics may still be earning far more than their marginal products, but the great contributions made from time to time more than offset this discrepancy. This may be an argument in favor of more research funding that will certainly increase the number of scientific discoveries. But I think that contributions at the very highest level are more a function of the number of geniuses, which, assuming nonselective breeding, is in turn a proportionate function of the size of population, once some minimum nutritional and educational standards are reached.

It is true that the existence of more people also means more criminals. The harm inflicted on an average person by criminals, however, is more a function of the number of criminals per million inhabitants, while the benefits
of contributions in science and arts to each person are more a function of the
total number of these contributions, due to the nature of knowledge as a pure
public good. An increase in population increases the total number of contrib-
utions and hence the benefits to each person, as well as increasing the number
of people enjoying these benefits. The same increase in population may not
change the number of criminals per million persons.

From the discussion above it may be said that a policy of encouraging
more births, at least for many cases, can be much better justified than one of
restricting births.

Notes

The author acknowledges the comments of Murray Kemp.

1 Notable exceptions are Mirrlees (1972),
Arthur and McNicoll (1977), and Cigno
(1983), whose results are largely against the
simple notion of population control.

2 Those who worry about the distribu-
tional impact of the pricing alternative (so the
rich can afford large families and the poor can-
not) should consult my third best argument
(Ng, 1984)—namely, that a dollar should be
treated as a dollar to whomsoever it accrues,
leaving the distributional objective to be
achieved by income taxation. Such taxation,
despite its disincentive effects, is better than
the violation of efficiency that has efficiency
costs in addition to its disincentive effects.

3 Likewise Julian Simon (1977, 1981),
convinced that population explosion is, with
war, one of the two most important issues fac-
ing mankind, embarked on a systematic study
of the economics of population growth and
found that the presumed dangers of the so-
called explosion are a myth.

4 As in all discussions of optimal popu-
lation, we are using a comparable cardinal util-
ity approach. Many modern economists are
skeptical of this approach after the ordinalist
revolution, which shows the adequacy of or-
dinal utility for the analysis of consumer
choice. Occam's razor requires that we shave
off the assumption of cardinalism in consumer
theory. But this does not prevent one from
using cardinal utility in social choice in general
and in population issues in particular. (To be-
lieve otherwise is to commit the "fallacy of
misplaced abstraction"; see Ng, 1979/1983,
pp. 13–16.) We do not need cardinal utility in
consumer theory since no interpersonal com-
parisons of gain and loss are involved as in
social choice. For social choice, even with an
unchanged set of individuals, no reasonable
decision (e.g., a Bergson–Samuelson social
welfare function) is possible without compa-
rable cardinal utilities (Kemp and Ng, 1976;
Parks, 1976; Ng, 1985).

5 I ignore the relatively minor technical
issue of intertemporal efficiency where infinity
is involved, on which see Malinvaud (1953)
and Paznar and Razin (1980).

A Pareto improvement is one that makes
someone better off without making anyone else
worse off. A Pareto optimal situation is one in
which all feasible Pareto improvements have
been made.

6 From the theory of second best, one may
think that the existence of monopolistic power
or other imperfections in other sectors of the
economy will impinge on the optimal choice
of family size. However, this effect is likely
to be very small as the choice of family is
largely affected by considerations other than
relative prices of goods. Moreover, unless
most overpriced (relative to marginal costs)
goods are highly complementary to children
or are substitutes for them and the reverse is
true for most underpriced goods, even the
small effects will offset each other. Hence,
from the theory of third best (Ng, 1977; 1979/
1983), one may proceed with the analysis of
the issue of population on the as-if assumption
that the rest of the economy is distortion free,
extcept when some specific major distortions
impinging directly on family size are present.

7 It might be argued that additional people
may also increase the per capita costs of some
other public goods. This can be true, however, only through congestion or some other form of external costs. A doubling of all inputs must at least double output as at least production could go on at twice the previous process. But as a consequence of indivisibilities, a doubling of all inputs may more than double output. Thus one may have economies of scale, but one cannot have diseconomies of scale unless some inputs (e.g., land) are held fixed so as to cause congestion.

8 For the extension of Pareto optimality to a variable population, see Friedman (1981).

9 Apart from the size of population, the growth in population may also stimulate innovation; e.g., see Boserup (1965, 1981) and Clark (1967). The emphasis on the size of population is made by Kuznets (1965, p. 128) and Simon (1977, 1981). For qualifications to the positive effects, see McNicoll’s assessment of the consequences of rapid population growth (1984, esp. pp. 199–202).

References


The Welfare Economics of Population Control


