Faculty Working Papers

Economic Dis-incentives For

Population Control

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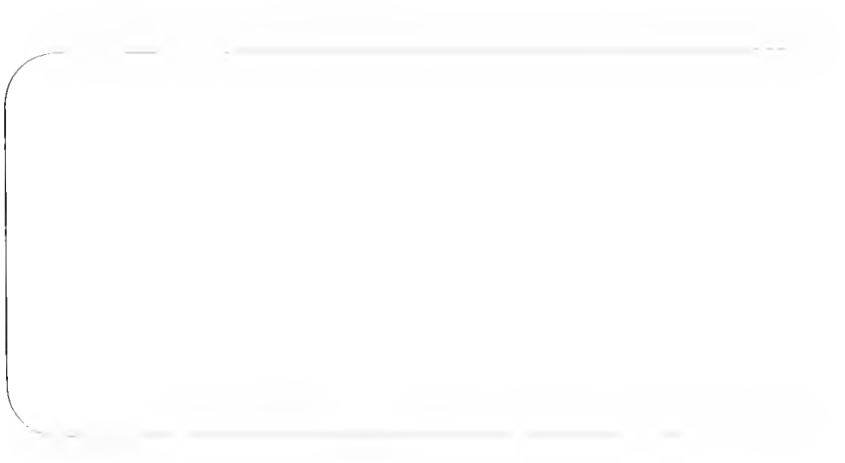

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Introduction:

One of the most rapidly developing issues of our time is that of population growth and its implications. Perhaps only the problem of war and peace so links the common destiny of all nations. Nevertheless, population growth has as yet to engage the professional attention of more than a very small fraction of economists.[1] Further, almost all

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[1] J. J. Spengler notes that only 1 to 1.5 per cent of articles appearing in the professional economic journals over the last 80 years have dealt with population. "The Economist and the Population Question" American Economic Review 56:1 (March 1966) p. 21.

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of the attention has been devoted to studying population control within the context of economic development strategies--not as an issue per se.

It is the premise of this paper that the study of population growth and policies for its control deserves far more effort than it has received in the past. It should be recognized, however, that although the issue is a global one the optimal solutions may very well differ among countries according to their level of economic and political development. In the developed countries their more advanced political and economic systems offer a greater range of methods for implementing population policy, especially methods which alter the economic incentives and dis-incentives affecting family size.

The purpose of this paper is to analyze some of the economic approaches which have been suggested for population control in developed countries.

As a basis for this analysis we start with the family-size decision viewed within the framework of consumer theory. In Part I the evidence that population control is needed in developed countries is briefly reviewed, as well as some of the suggestions for effecting such control through economic incentives. In Part II consumer choice theory is used to analyze these suggestions and to compare them from the point of view of economic efficiency. Part III some of the practical and ethical aspects of using economically efficient methods are explored. Finally, in Part IV the argument is summarized and some broad conclusions drawn. For illustrative purposes the U. S. will be used; however, the analysis is applicable to developed countries generally.

PART I - The problem reviewed:

Overpopulation is a credible threat in developed countries only if the impact of existing policies plus other social changes (e.g. liberalization of abortion laws) cannot be relied upon to reduce population growth to zero in the near future in these countries. A number of demographers and other social scientists have argued persuasively that zero population growth cannot reasonably be expected to be achieved by these forces but will require some form of conscious social intervention. Their arguments are usually developed as a criticism of "family planning" policies when these policies are pre-

sumes to constitute population control policies.

The principal thrust of family planning policies within the U. S. is to provide parents with the maximum choice regarding their family size. This policy is implemented through research on more effective contraceptive methods and the fullest possible dissemination of knowledge regarding these methods. It is clear that there currently exist numerous effective methods of contraception and that the level of knowledge and availability among parents in the U. S. is quite high, only the very poorest being an exception. However, the existing evidence on attitudes regarding ideal family size shows an average family size of around three children, which is significantly above that compatible with zero population growth.[2] Further, the ideal family size is quite

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[2] Judith Blake, "Are Babies Consumer Durables?" Population Studies, 22:1 (March 1968), pp. 5-25. This study amasses survey data on ideal family size. The average is consistently close to 3.0.

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uniform across all socio-economic levels. Consequently, even a 100% "successful" national family planning policy will still result in a growing population if stated ideal family sizes are achieved. This indicates the potential need for additional policy measures to control population.

Part II - Economic Analysis

We now turn to an analysis of alternative methods which have been proposed for the control of births. Three different proposals will be analyzed: the approach of the Zero Population Growth activists, the use of taxes levied on high order births, and finally Kenneth Boulding's

proposal for the use of negotiable licenses.

As a framework for this analysis we will follow Becker and assume that the demand for children can be analyzed within the framework of consumer theory.[3] We assume that each set of parents has jointly deter-

[3] Gary Becker, "An Economic Analysis of Fertility," in National Bureau of Economic Research, Demographic and Economic Change in Developed Countries (Princeton, 1960), pp. 209-240. For an earlier use of economic analysis to analyze methods for promoting population growth, see J. J. Spengler, "Some Economic Aspects of the Subsidization by the State of the Formation of 'Human Capital'," Kyklos 4 Fasc, 4(1950). pp. 316-343.

mined a consistent preference function for children. We further assume that children of a given quality have a known market cost-price per child which the family must incur. This cost-price is composed of the food, clothing, shelter, medical expenses, etc., which the family must bear to "produce" a child of a given quality. For convenience we assume that the cost-price is constant for a family, that is, there are no economies or diseconomies of scale with respect to family size. From these assumptions an aggregate "market" demand curve can be derived. This is shown in Figure 1. This cost-price combined with market demand suffices to determine the quantity of new children demanded during a given period.[4] We accept the arguments of demographers reviewed above

[4] We use births and new children interchangeably.

that this quantity, Q_1, would produce a positive population growth.

In Figure 2, we analyze the effects of the three selected proposals

FIGURE 1

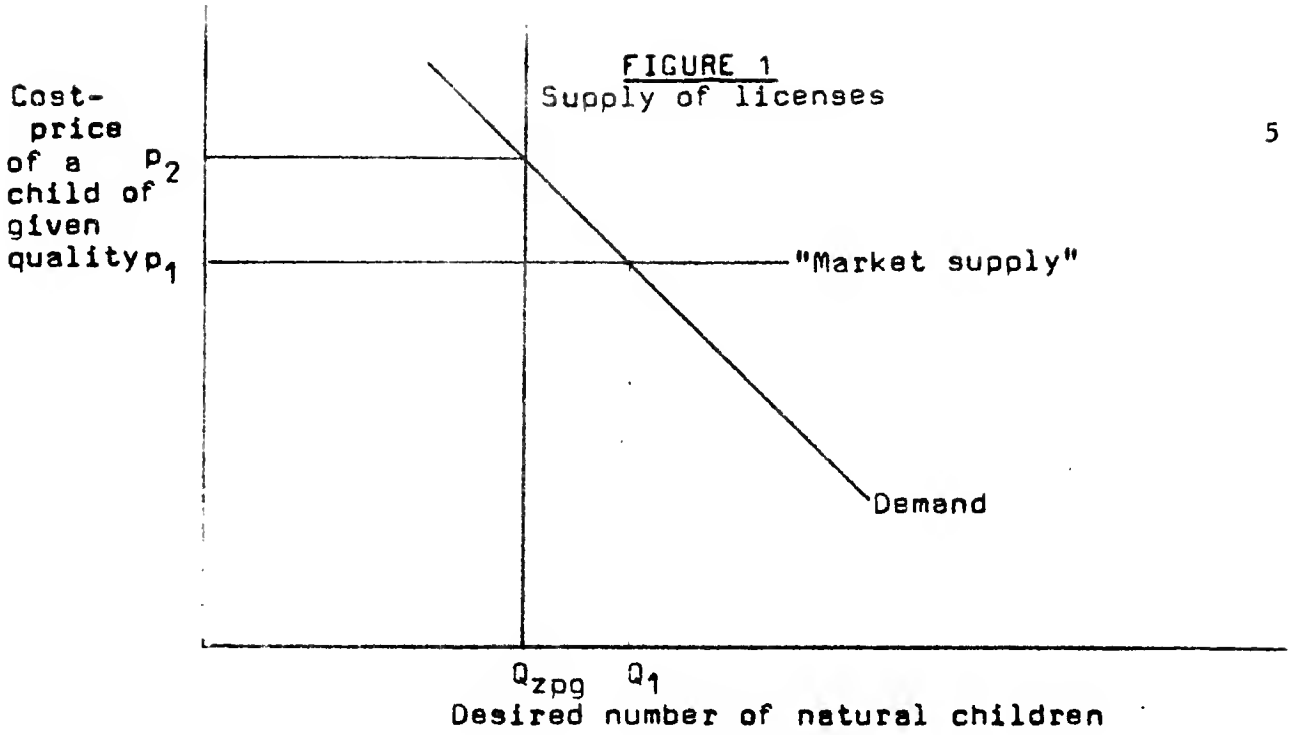
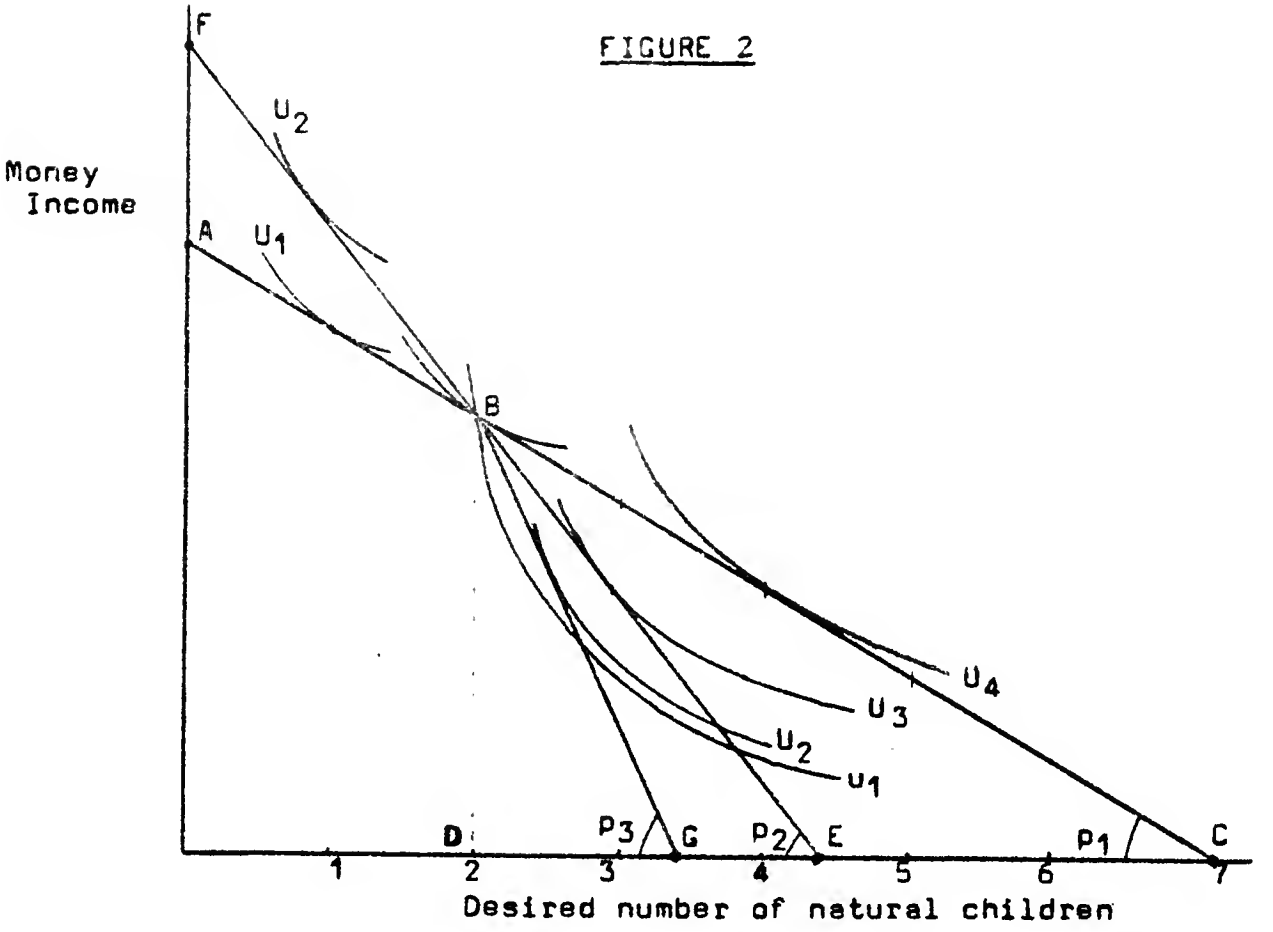


FIGURE 2



on the welfare of families with different preference functions for children. To keep the diagram as simple as possible we will assume that every family has the same income. We consider three families with a preference at the initial market price P_1 for one, two, and three children respectively.[5]

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[5] Children are obviously not divisible into anything less than whole units. Given this fact a set theoretic approach is most applicable. We ignore this problem because our main conclusions would remain unchanged by this more refined approach.

The method currently being used by activist ZPG groups involves developing and applying social pressure in an effort to discourage parents from having more than two children. This "bumper-sticker" approach to population control, if effective, would cause the parents desiring three children in Figure 2 to restrict their family to only two.[6] This would reduce their level of welfare from U_4 to U_1. The level

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[6] It should be noted that the ZPG activities could also be interpreted as educational rather than coercive, that is, as an effort to persuade parents to voluntarily change their preference for children. This approach would still leave unsolved how the "fractional children" were to be allocated.

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of welfare of parents desiring two or fewer children would be unaffected by this method of population control. Such a crude method as this, if effective, would not produce true zero population growth. If no family has more than two children and <u>not all</u> families have that many, negative population growth will result. If the correct average family size

is around 2.2 as Boulding suggests, some but not all families could have more than two children without producing positive population growth. This crude approach completely ignores the problem of selecting those families that could have more than two children--that is, of allocating the fractional children.

A second method and one which would no doubt quickly come to the minds of U. S. legislators is the use of that all purpose tool of social policy--the Federal personal income tax. The most direct and simplest way to apply tax policy to population control would be to allow dependent deductions for only two children; parents would receive no deductions for higher order children.[7] Such a policy would only affect

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[7] A variant of this is to tax higher order births explicitly rather than implicitly. (See Spengler, op. cit., p. 21). From the point of view of our analysis these are equivalent policies, the major similarity being that tax charges or deductions on specific births cannot be exchanged between families. The distributional effects of these two would be different. Families too poor to be taxable would not be "taxed" by the implicit method but only the explicit tax.

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families with preferences for three or more children. The effect would be to increase the cost-price of third and higher order births in the family. In Figure 2 this is illustrated by P_3, the complete price line being ABG with a kink a B. Like the policy of ostracism, it reduces the welfare only of families desiring three or more children. For our illustrative three-child family in Figure 2 we see this loss as a move from level U_4 to level U_2. Nevertheless, this policy is superior to

the policy of ostracism, level U_1, because it permits parents, if they wish, to have large families by giving up other consumer goods to pay the tax on higher order births.[8]

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[8] We have ignored how the additional tax revenue is used. It could of course be redistributed through a proportional decrease in basic tax rates. A redistribution would shift line ABE upwards in Figure 2.

The final policy to be analyzed is the negotiable licensing scheme of Boulding. He has proposed that each person upon reaching maturity receive a license for the number of births just consistent with zero population growth (ZPG).[9] Boulding suggests that a license for 1.1

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[9] Kenneth Boulding, The Meaning of the 20th Century (New York: Harper, Row and Co., 1964), p. 135. Also discussed at greater length in his Economics as a Science (New York: McGraw-Hill, 1970), pp. 38-39.

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births is the appropriate number within the U. S.[10] For convenience we

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[10] Boulding does not present any supporting analysis for his use of 2.2 average completed family size to achieve a stable population. For alternative estimates which do give a supporting analysis see Warren S. Thompson and David T. Lewis, Population Problems (5th ed.), (New York: McGraw-Hill, 1965), pp. 270-271, or Ansley J. Coale, "Man and His Environment," Science, October 9, 1970, p. 135. Coale's estimate is 2.25 and Thompson's estimate is 2.38.

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choose to use 1.0. The number of new licenses issued during the period are shown as Q_{ZPG}; this fixed quantity becomes the effective supply curve in the market.[11] The cost-price of a child then is raised to P_2.

[11] Our analysis abstracts from speculation in licenses. In practice, a speculative excess supply function would probably exist and should be added to the supply of new licenses. Further, if this scheme were adopted, I would anticipate the creation of a forward market in licenses. These complications are beyond the scope of this paper; however, the existing theory of the forward markets seems directly applicable if this analysis were to be so extended. Further, forward markets would produce additional social benefits in the form of more efficient intertemporaral exchange. Only the licensing scheme would permit forward transactions.

This represents the cost of inputs purchased by the family plus the market value of the license, $(P_2 - P_1)$.

This alters the choice situation by rotating the price line around point B, the original choice point of the two-child family. Each set of prospective parents has its money income raised by AF, the market value of their two licenses and they now face a higher price for children, P_2. The new price line P_2 starting at F must also go through B because families who actually opt for 2 children must give up this additional income when they turn over their license to the government.[12]

[12] The new price line goes through B in this example because we have assumed that licenses are issued on the basis of one license (child) to each person reaching maturity. If, say, 1.1 licenses were issued, the new price line would pass above point B.

Consequently, for families making this choice, the amount of income left for all other goods is DB either with the licensing scheme or with the no policy situation, cost-price P_2. This scheme, unlike the ones discussed above, affects the choice of parents with original choices of two or less children as well as those with original choices of more

than two children. Those families who originally would have chosen zero or one child experience simultaneously an increase in money income and the increase in the price of children. This total effect could, of course, cause families who had planned to be childless to now have one child because the additional money income of the one unused license more than compensated for the increased price of the single child. Families who had originally planned to have one child would not be induced to increase their family size beyond one child because to do so would leave them with no net increase in money income but yet paying a higher price for their children. Some of the original one-child families might, however, reduce their family size if the price substitution effect of the higher price more than offset the effect of the increase in money income. Families who had originally planned to have two children would have no net change in money or real income if they persisted in this choice. However, both the price substitution effects and the option of exchanging a planned child for the money income of the license may cause some of these families to reduce their planned family size to only one or possibly zero children. Families originally planning families of three or more children will experience a net reduction in real income with the increase in the cost-price of children. Both the price substitution effect and the income effect will induce a reevaluation of their family size plans towards a smaller number of children.

We assume that the tax on higher order children P_3 is just sufficient to produce a zero population growth. Further we have drawn it in Figure 2

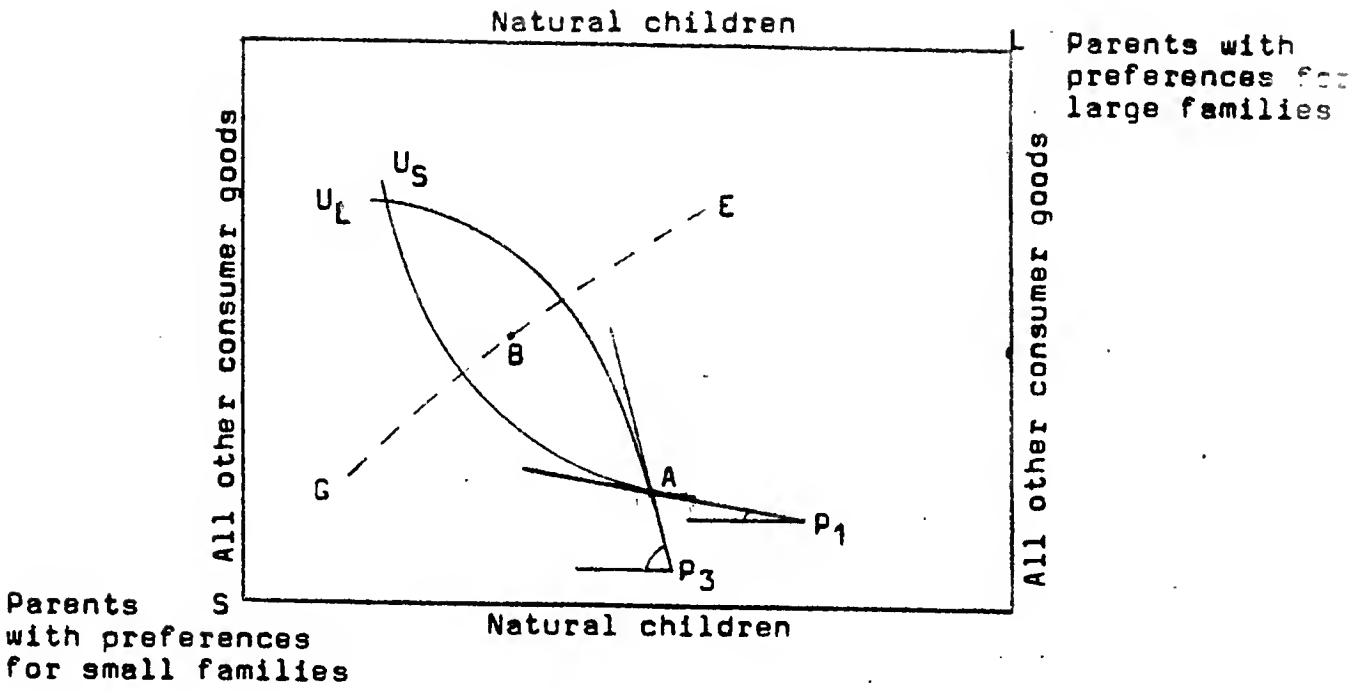
so that it produces a higher effective price for higher order children than the price, P_2, for these higher order children. Whether this in fact represents the correct relationship between these two approaches when each produces a zero population growth is an empirical question. The determining issue is whether the licensing scheme produces a net increase or decrease in the demand for new children by the families originally selecting zero, one, or two children. The above reasoning shows that the introduction of the licensing scheme could only induce an increase in family size of the originally childless families and then an increase of only from zero to one child. For the families originally choosing one or two children the licensing scheme could only either leave their choice unchanged or reduce it. We assume that there would be a sufficient reduction in demand of these families to more than offset any increase in demand by the original childless families; hence, P_3 is drawn higher than P_2.

With the above assumption Figure 2 shows that the licensing scheme provides a superior policy to the scheme for taxing higher order children or to ZPG bumper-sticker policy. It is superior in the sense that all families are either better off or at least no worse off under the licensing scheme than under either of the other two. This result comes about because the utility level of families with preferences for large families is reduced less under the licensing scheme. Some reduction in their utility must occur under any of the schemes if a stable

population is to be achieved. The licensing scheme permits the rights to children to be exchanged for all rights to all other types of consumer goods (money income) between families with relatively strong preferences for children and those with relatively strong preferences for all other consumer goods. Both of the other policies preclude any such exchange.

Even if we drop our assumption that P_3 is higher than P_2 the theory of optimal exchange would still show the licensing scheme to be superior. This is illustrated in Figure 3. The excise tax on high order children produces a higher effective price for children for those families with a strong preference for children than the price faced by the families with preferences for small families. This differentiation in cost-prices for children relative to the prices of all other goods would produce an equilibrium point such as point A in the box diagram of Figure 3. The dimensions of the box represent the total equilibrium quantities of children and all other goods that would have been chosen under the tax scheme. At point A both sets of parents have equated their marginal rates of substitution to the effective relative prices they each face. The slope of the tangents to U_s and U_l at A reflect the price of children relative to all other goods. Both families could improve their welfare if they were permitted to exchange goods for the tax benefits of small families and thus move to some point such as B which is on the efficiency locus G-E. This they cannot do, of course, since children cannot be exchanged.

FIGURE 3


Natural children
Parents with preferences for large families
All other consumer goods
U_S
U_L
E
B
G
A
P_1
P_3
All other consumer goods
Parents with preferences for small families
S
Natural children

Of the three methods for the social control of population which we have considered the licensing scheme is clearly superior. Our method of analysis may be objected to, however, as being too abstract; that is, it omits other considerations which are quite important if one is to draw policy conclusions from this analysis. For example, what is to be done if parents produce a child without a license in defiance of the law? It is to considerations such as these that we now turn.

PART III - Problems of Implementation:

Although we have established the superiority of the licensing scheme from the point of view of exchange efficiency, this analysis was carried out at a high level of abstraction. In this section we consider some of the objections that might be raised if one abandons the comfort of this high level of abstraction. In particular we shall consider probmens of enforcement and of distributional equity.

Penalties for Non-compliance

Boulding has suggested that the penalty for non-compliance be involuntary sterilization.[13] So long, however, as sterilization is an irre-

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[13] Boulding, op. cit. (1970), p. 39.

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versible procedure (as at present), this penalty seems harsh indeed. A socially more acceptable penalty would be to fine the offender the market value of a license plus some "court costs." The government could then use the proceeds of the fine to retire a license through an open

market purchase. A problem with this approach arises, however, when the offending parent does not have the financial means to pay the fine, or if the individual's income is so low that forced payment in effect punishes both the offender and the innocent child. Indirectly punishing an innocent child offends the social consciousness and, of course, is contradictory to the many social policies which are designed to insure some minimum standard of care for children. Given this problem of being unable to penalize the real income of a parent without simultaneously penalizing the child, involuntary sterilization may have to be used for chronic offenders who are unable to pay the fine.

Distributional Equity

It is well known that observed family size is inversely related to income; whether one can conclude from this observation that children are inferior goods in economic terms is a much debated question.[14]

[14] See for example Blake, op. cit.

But if we do assume that children are inferior goods and that the percent of income expended on the support of children is also inversely related to income then any tax on these expenditures would be regressive. By this reasoning the licensing scheme could be considered a hidden form of regressive taxation if the poor do indeed have on the average higher preferences for larger families than do the rich.

The assumptions leading to this conclusion bear a more careful

examination. First, the empirical relation that is observed between income and family size may reflect a differential knowledge of/or access to contraceptive methods. That is, many more of the births in low income families may be unwanted births than births to high income families. A recent analysis of a 1965 sample survey of the number and distribution of unwanted births found that at the time of the interviews, 32% of all births of respondents who were classified as "poor and near-poor" were unwanted, while only 15% of all births of respondents who were classified as "non-poor" were unwanted.[15] This result

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[15] Larry Bumpass and Charles F. Westoff, "The 'Perfect Contraceptive' Population," Science, Vol. 169 (18 Sept. 1970), pp. 1177-1182, Table 4.

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calls into serious doubt the assumption that children are in any meaningful sense (i.e. the result of conscious voluntary choice) a consumption good predominantly of the poor. A more direct approach to family size preference is to ask individuals directly what they feel is the ideal family size. As noted earlier survey data on answers to this question shows very little variability of ideal family size across income classes.[16]

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[16] Blake, op. cit., Table 2, p. 12.

On the basis of this empirical evidence we conclude that any form of tax uniformly applied on all births would not be regressive, if desired levels of family size were attained. Hence concern over the regressivity of this licensing scheme is misplaced. Of course to the extent

that desired family sizes are not being attained, this raises an important prior issue in its own right--the issue of family planning services for all. There is a recognition of this issue by Congress in the form of a program to bring family planning service to all individuals.[17] How-

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[17] Family Planning Services and Population Research Act of 1970 (P.L. 91-572).

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ever, even if this program is completely successful and we attain the "Perfect Contraceptive Population" this population may very well still be a growing population; hence some direct approach to the social control of population, such as the licensing scheme, will be needed if population growth is to be controlled.[18]

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[18] Bumpass and Westoff estimate in their study that if women who were near the end of their child bearing in 1965 (ages 35-44) had been able to avoid all unwanted births their average fertility would have been 2.5 children. A replacement population in the U. S. implies an average fertility of around 2.25 (Cf. note 10 above).

Let us now consider the regressive or non-regressive nature of the alternative policy of removing the personal income tax deduction from third and higher order births once the family planning problem has been solved, i.e., when all unwanted births are eliminated for all income classes. The empirical evidence we have reviewed generally indicates that average family size will be approximately uniform over all income classes if desired family sizes are attained.

Assuming this is to be the case then loss of the income tax deduc-

tion for the third or higher child would be clearly regressive for two reasons: first, the progressivity of marginal tax rates and, second, the fact that the poorest in the population do not have any taxable income.

PART IV - Summary and Concluding Observations:

For any policy that limits in any way desired family size, the most important ethical issue to be faced is in what sense, if any, natural children are an inalienable right and if so how a policy of population control relates to this right. In this respect the licensing scheme and the limited tax deduction are substantially different.

The licensing proposal implicitly assumes that procreation is an inherent right in two senses. First, it is a right not contingent upon any prior economic or social status up to the point that an individual's procreation equals one's own replacement. This is assured by giving a license free to each individual at his majority. Procreation beyond replacement does however require an economic quid pro quo and is thus not assumed to be an inherent right. Second, procreation is a negotiable property right--the right may be transferred in the market. This is ethically just--if excess population produces social costs because individuals who voluntarily contribute to reducing these social costs through small families should be rewarded.

By contrast, the tax deduction for replacement children is a right whose value is contingent upon having taxable income. The state im-

plicitly rewards the rich more than the poor. Secondly, individuals who voluntarily contribute to ameliorating the costs of excess population through having a family of sub-replacement size receive no compensation from the state for this act.

One final issue related to fertility and low income is the possible effect of the licensing scheme on the "perceived" price of children. One feature of the purchase of consumer durables is the relative unimportance attached to the rate of interest on the finance charges compared to the size of the down payment. Purchase decisions appear to be much more sensitive to the latter than to the former. If one then accepts the analogy of Becker that fertility can be appropriately analyzed using the theory of consumer durables, then this very high time preference may make the licensing scheme particularly effective. This is because at present the size of the "down payment" associated with a birth is quite low compared to the total cost of raising the child to the age when he becomes economically self sufficient. The adoption of the licensing scheme will operate to change this time pattern of costs by providing an explicit and measurable down payment. The schemes which reduce the tax deductions accorded children would be less effective if consumers apply high rates of time preferences to the reduction in their future income streams.

SUMMARY

It is the premise of the paper that the social control of population

is a real issue for both the developed and less developed nations. For the former nations the policy options are greater because of their more highly developed economic systems. This permits a greater variety of ways in which economic incentives affecting family size may be altered. In the U. S., policy discussions reflect this by frequent references to the use of tax policies as a means for the social control of population. We have argued that tax policies which do not bear uniformly on each birth within a family are economically inefficient in that they restrict the achievement of optimal exchange between families. Tax penalties or deductions cannot be exchanged.[19] The alternative of issuing negotiable

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[19] An economic rationale for taxing higher order births could be established if the social costs of high order children exceeded their private costs. Arguments by ZPG groups that children from small families are better adjusted socially, more intelligent, etc. could be interpreted to support a divergence of social and private costs for high order children. One example of such claims is: E. James Lieberman "The Case for Small Families" New York Times Magazine, March 8, 1970, pp. 86-89. In this paper we implicitly ignore these distribution issues and focus only on the social control of total population size.

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licenses to each individual at majority provides a system of contol which produces optimal exchange efficiency.

Although negotiable licenses will strike most people as an absurd scheme, this largely reflects the failure of the economics profession to communicate effectively the results of their science to policy makers and to the public generally. Further the greater familiarity of the tax system often leads to its use to achieve goals which could more

appropriately be achieved by other methods. The long existence of mandatory registration of all males under the Selective System demonstrates that society can communicate effectively with individuals at the time they achieve their majority. This plus our well-developed system of reporting births indicates that the licensing scheme is administratively feasible. The private economy would quickly produce a market for the exchange of these property rights as the economy has done for such other rights as stock certificates or real estate.