

PARENTAL MALINCENTIVES, SOCIAL LEGISLATION,
AND DEFICIT FINANCING

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ABSTRACT

An elaboration of Marshall's parental malincentive argument provides a detailed economic rationalization of the commonly observed qualitative pattern of social legislation around the world. Nevertheless, our theoretical and empirical analysis also shows that public-good benevolence has been too weak for voter-efficient, balanced-budget democracies to provide Pareto-sufficient levels of collective investment for their youth. This confirms Pigou's classic conjecture on the inefficiency of simple democracy.

A realistically benevolent, voter-efficient democracy can, however, eliminate Pigou's nonoptimality if the democracy also adopts a policy of collective lump-sum redistribution from the young. Such a policy, in the form of peacetime deficit financing, has recently evolved in various wealthy democracies and indeed appears to have eliminated the Pareto nonoptimalities of Marshall and Pigou. Nevertheless, for a full social optimum rather than simply a Pareto optimum, political representatives in deficit-financing democracies must retain a paternalistic bias toward protecting future generations so that they choose a lower deficit than is in the interest of the voting public.

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The past couple of centuries has witnessed a worldwide legislative evolution of a particular set of statutes regarding the welfare of children and the aged. These are primarily laws against child abuse, restrictions on child labor and minimum wage laws, compulsory and free public elementary education, and social security and medicare programs.¹ Often termed "social legislation," this set of laws is so widespread across different political systems and so well-entrenched that it seems unreasonable to view it as a significantly inefficient response to the narrowly conceived special interests of certain political pressure groups. Rather, it appears much more reasonable to infer either that such legislation serves merely as a useful form of humanistic window dressing with few real allocative effects or that its political success comes from its ability to correct what otherwise would have been significant misallocations.

¹See, for example, United Nations Educational, Scientific, and Cultural Organization, U.S. Department of Health, Education and Welfare, and Friedlander.

*The research assistance of Bob Williams is gratefully acknowledged. The number of commentators contributing to the final draft of this paper has been so large that we are unable to mention some commentators without doing justice by imposing a like amount of damages on others.

Numerous empirical studies cast doubt on the former possibility. For example, studies by Sanderson, Mitchell and Clapp, Linneman, and Welch indicate that child labor and minimum wage laws in the U.S. substantially reduce youngsters' labor force activity. In the case of social security, Kotlikoff's findings indicate that, aside from redistribution effects, the U.S. system significantly reduces pre-retirement consumption. With respect to education, Chiswick's research indicates a very significant effect of free public education on the quantity of education adopted in a country.²

²While empirical studies of the effectiveness of compulsory education laws display a substantial positive correlation between school enrollment and the extent of the laws, most of these studies' authors have argued that the independent effect of compulsory schooling laws in multivariate models is relatively small. This is clearest in Stigler's classic study, which standardizes for per capita income and racial characteristics. But, since the method by which states with higher per capita incomes achieve increased education levels may well be the imposition of stiffer compulsory laws, it is not really legitimate to infer the insignificance of such laws from their small independent statistical effect. These estimated effects are likely to appear small because of the relatively large errors of observation on the compulsory education variable and the fact when the letter of the law does not match its spirit (measured in this case by per capita income), the application of the law is bent toward the spirit.

Subsequent studies by Folger and Nam and by Landes and Solmon, testing Stigler's conjectured explanation for the simple correlation, indicated that previous growth in enrollment has been a common factor explaining both current enrollment growth and the emergence of compulsory education laws. However, these studies do not effectively control for the growth in demand for public education, which might be isolated by adequate measures of state per capita income or per capita expenditures on education. Although this prevents us from making inferences from these studies regarding the independent effect of compulsory education laws, even if state demand were effectively controlled for, a statistically insignificant regression effect of changes in compulsory education laws on changes in school enrollments would not be conclusive due to the same kind of multicollinearity-measurement error problem that makes the original Stigler results inconclusive.

In two studies using later and statistically probably more reliable samples, Edwards (1975, 1978) apparently does control quite effectively for demand factors. Accordingly, she finds a significant independent effect of compulsory education laws on school enrollment rates in a single equation model. (Her 1978 study also develops a simultaneous equations model whose estimation points faintly back to the original Stigler hypothesis, but her nonlinear specification clearly magnifies the errors of observation on the compulsory education variable, thus restoring much of the original bias.)

Therefore, by elimination, the hypothesis that social legislation tends to cure basic economic inefficiencies becomes the most believable. However, it is quite apparent that the many arguments put forth to support such legislation, as West has cogently argued, have had extremely weak welfare-economic foundations. Among these arguments, the least popular, but perhaps most promising, points to the almost universal property rights imperfection wherein a parent is given authority over his young children but no rights to the benefits he creates for the children.

The earliest economic statement of this parental malincentive argument is apparently Alfred Marshall's discussion of the peculiar incentives facing the parents of a given worker:

Those who bear the expenses of rearing and educating him receive but very little of the price that is paid for his services in later years (pp. 560-61).

While Marshall felt that this imperfection justified policies to encourage investment in children, he neglected to derive a complete set of policies that would efficiently respond to the problem. The main purpose of Sections I-III of this paper is to derive such a policy set.

Section I of the paper presents a two-period model with a single parent and his child in which each person's resources can be devoted to leisure, work, or the development of the child's future skills. The parent, who gains utility from his child's own lifetime utility, is responsible for how his child's period-1 resources are employed and also devotes some of his own resources to the child's mental development. Lacking private property rights to benefits he creates for the child, the parent collects no material rewards from his grown-up child unless he has trained a sense of filial gratitude into the child. Such training will induce the grown offspring to share some of his adulthood production with his aged parent. In this

environment the typical parent both Pareto-undervalues resource employments that provide real benefits for the youngster and overvalues resource employments that increase the parent's share in their youngster's future income. However, these Paretian inefficiencies do not occur in those atypical families in which the parents plan to give lump-sum transfers to their young adult children.³ This is our first optimality theorem.

Section II argues that while these welfare results indicate a case for a certain form of government intervention, they do not suggest any simple tax/subsidy solution. Rather, regarding observable childhood activities, the results suggest a combination of minimum quantity and quality restrictions, where the standards are based upon the observed choices of lump-sum-granting parents. Such standards are, in fact, commonly observed. Perhaps some economists have been too hasty in criticizing: (1) governmentally imposed minima on both the quantity and quality of education of all youngsters, (2) family welfare relief tied to the provision of minimum consumption standards for children, and (3) minimum wages and similar

³This should not be confused with the "Rotten Kid Theorem," of Becker [1976], which implies that a selfish child currently making independent production decisions for his family will -- under an extremely special condition on the technology -- make Pareto optimal production decisions for the family if he expects future lump-sum transfers from his parents. In our model, parents are never subject to the independent production decisions of their children. Parents or the government dictate the various consumption and investment decisions of young children. And fully grown children who do make independent decisions, do not make production decisions for the parents. We consider only cases in which grown children make simple transfers of resources to their aged parents. If our grown children did make some family production decisions, there would be little reason for us to follow Becker in preventing elderly parents from cooperating with their grown children regarding these decisions (see Tullock's discussion of Becker's Theorem). Moreover, such cooperation would be typically necessary for a family optimum despite Becker's theorem because the theorem only holds for those extremely restrictive technologies in which the child receives no current disutility from his production decision, not even a current disutility from his own effort.

legal barriers limiting the employment of children and young female adults. The widespread, "basic needs" mentality of both social activists and public officials, which has been long attributed by economists to the public's ignorance of basic price theory, is thus rationalized as a policy framework necessary for the achievement of a Pareto optimum. Moreover, the same economic theory applies in a technology slightly broadened to include life-risk decisions by adults. An adult who does not make lump-sum transfers to his children, or to other beneficiaries of his benevolent existence, takes too many chances with his life. Risking his life for a high consumptive return will impose external costs on this collective of would-be beneficiaries, whom he does not fully compensate for the increase in his life-risk. The result is a simple economic rationalization of a whole set of additional, otherwise-unjustifiable, governmental agencies enforcing minimum amounts of safety both on the job (OSHA) and in the consumption of food (FDA), transportation services (FAA and NTSB), durable consumer goods (CPSC), and buildings (local building and safety commissions). Finally, Section II argues that to prevent parents from over-engaging in the myriad of unobservable training activities serving to increase the future transfers that they expect to receive from their grown children, compulsory participation in a social security system with medicare appears to be the only policy option available. In any case, social security provides a necessary policy complement to the above, "basic-needs" type of quantity- constraints on observable parental decisions.

Section III introduces a variable population growth rate and shows how the theoretical analysis of Section I also applies to the rarely discussed issue of whether the laissez-faire rate of population growth is Pareto optimal. Given that the optimal policies of Section II are all in place, we

find that a substantial subsidy to childbearing by typical parents is required to induce these people to have a Pareto sufficient number of children. This policy is also commonly observed. It comes in the form of heavy government subsidies to primary and secondary education. This section completes our set of Pareto optimal policies and correspondingly supplies a complete qualitative rationalization of observed social legislation.

Section IV contains our political analysis. It begins by pointing out that, in the absence of extra-familial benevolence and deficit financing, a society with an internally efficient political system comprised of voting adults and non-voting children (i.e., a "democracy") would not impose greater sacrifices on the adults for the children's benefit than the adults would privately choose for themselves (Pigou, West, pp. 11-12). The same kind of property rights imperfection that characterizes the private system would also characterize this democratic system. The adult voters, having the same inability to command compensation for the benefits they collectively provide the younger generation, would produce no social legislation. However, we then show that when adults are just slightly benevolent to individuals outside their own families, an internally efficient democratic system would provide a greater level of investment in children than a private, laissez faire system. Nevertheless, extending our basic theoretical result of Section I to this voter-efficient, adult collective, it remains a definite theoretical possibility that benevolence toward other families is insufficient for this internally efficient system to increase investment in children all the way up to a Pareto optimal level. In particular, where collective benevolence is insufficient to induce collective lump-sum transfers to emerging young adults, a simple, internally efficient, democracy will provide Pareto-insufficient benefits for its

children. In fact, such transfers are not observed, not even in our wealthiest democracies. Pareto optimal levels of investment for the benefit of children, are, of course, theoretically achievable by suitably authoritarian means, i.e., by replacing the simple democracy with a more authoritarian form, as was suggested long ago by Pigou, or by extending the property rights of parents. In either case, Pareto optimal levels of observable variables are achievable by simply ordering compensatory transfers to sacrificing parents. Indeed, the statistical results of this section indicate that a typical authoritarian government supplies substantially more observable benefits to their children than a typical democracy. Moreover, throughout most of the past century, U.S. expenditures on primary and secondary education have behaved much more like charitable expenditures than like real investment expenditures. Nevertheless, these patterns do not hold for our wealthiest democracies in recent times. To explain the apparent allocative improvements in wealthy democracies, we generalize our theory by allowing the democracies to adopt policies of peacetime deficit financing, policies equivalent to lump-sum redistributions away from the young (Thompson, [1967]). Such policies, in effect, allow adult voters to compensate themselves for their collective investments for their young. That is, under a plausible assumption on the nature of political participation, a simple democracy with no constraints on the voters' use of deficit financing will provide Pareto optimal levels of investment for its young. This is our second optimality theorem.

The remainder of this paper, which was written several years after the above-described sections were essentially complete, reflects a more coherent, and more historically connected, view of social organization.

Section IV.C shows that a simple democracy with no constraints on the voters' use of deficit financing will always over-redistribute from its young. This is because the last dollar of redistribution from the young generates an essentially zero net benefit to the voters but a whole dollar of real cost to the victimized young. A military overseer or founder of the socio-political system with humanistic preferences, i.e., a utilitarian social welfare function (Thompson-Faith), would therefore be better off if he reduced the extent of such redistribution. To achieve this natural distributional goal, the founders must constrain -- and, we argue, traditionally do constrain -- their political systems by superimposing on them religious or legal establishments that indoctrinate future political decision makers with a paternalistic moral bias against direct transfers from the young. But the traditional legislative interpretation of this moral bias, a Calvinistic scripture against all peacetime deficit financing (Buchanan and Wagner), is overly harsh because it generally induces democracies to provide Pareto-insufficient real benefits for their children. Also, it may make future generations too wealthy. A welfare-superior legislative interpretation of this moral bias would sometimes allow peacetime deficits. More precisely, an internally efficient democracy will achieve a full social optimum if its legislative representatives always have a sufficiently non-representative, paternalistic bias against redistribution from the young.⁴ This is our third and final optimality theorem.

⁴With the optimality of social legislation critically dependent on parents having the right to collectively lump-sum redistribute from their children through deficit financing, we should consider why we do not simply grant parents the right to privately lump-sum redistribute from their own children in the first place. Why accept Marshall's institutional constraint as given? Why not simply allow parents to privately impose financial liabilities on their children and adopt a laissez-faire policy except for collective lump-sum subsidies to the young to reflect collective extra-

Section V introduces production activities that are naturally undertaken by the government. Government production in balanced-budget democracies should suffer from collective parental malincentives in the same way that governmental support for private-goods production (e.g., education) suffers. Historically, the most important governmental production activity is probably warfare, whose most costly input is the lives of its politically powerless young male adults. Thus, a state suddenly becoming a relatively poor democracy should be expected to quickly step-up the severity of its peacetime military training and soon thereafter become a violent military aggressor. Our historical survey testing this implication reveals a striking historical regularity in this regard.

familial benevolence. One reason, along the lines emphasized above, is that there are numerous parental training activities that would increase the child's future ability-to-pay and thus the size of the loan the parents can obtain; these would be overdone by insufficiently benevolent parents. A second, more basic reason is that extra-familial benevolence could not be expressed in the laissez faire system. Lump-sum subsidies to the young would just increase the size of the loan to the parents. The desired net subsidy could not be implemented. A final argument for the social superiority of governmental deficit financing, combined with our complex set of interventions, over laissez faire and private deficit financing is that rational parents, no matter how benevolent, underprovide benefits for their children in the sense that the humanistic overseer or founder of the entire system -- realizing that any parent is essentially indifferent to his last unit of sacrifice for his child while the child is a clear beneficiary -- would obviously prefer additional transfers to the child. This problem is largely solved in democracies in which representatives retain, through traditional moral or professional training, a paternalistic bias against redistribution from the young. (Paradoxically, however, no government can achieve more than Pareto optimality for the offspring of lump-sum granting parents, who necessarily, despite their unusually high degree of benevolence, privately under-redistribute toward their children. Any governmental attempt to redistribute more to those offspring than is desired by their benevolent parents is thwarted by offsetting reductions in the private lump-sum transfers from these parents. As the resulting loss in utility to a humanitarian founder is probably insignificant, we too shall regard the loss as insignificant.)

I. THE MODEL

A. The Technological Environment

Our model involves a youngster and his adult parent in a two-period world. During the first period the youngster is a child. When the second period arrives, the youngster becomes a young adult, a status technologically characterized by the youngster's loss of his previous informational inferiority vis-à-vis his parent's information set, and the adult parent becomes elderly. Ending after the second period, the model rules out the possibility of later generations in the interest of expositional simplicity.

The human capital associated with each individual is the only productive resource formally considered. As a child and later as a grownup, the youngster's natural supplies of human capital are fixed at unity. Leisure represents one use for this capital, a youngster devoting Y_1^L to this activity as a child and Y_2^L as an adult; work is another use, where Y_1^Q and Y_2^Q are the respective amounts of the offspring's human capital employed to produce Q , a transferable consumption commodity; and childhood work-skill development (schooling), denoted Y_1^W , is a third and final alternative of the offspring's human capital. The grown-up child's production of the commodity depends on the quantity of his parent's resources devoted to developing the child's future work skills, A_1^W , as well as on the quantity the child's own childhood resources devoted to this purpose. In summary, the conservation constraints in using the youngster's resources in each period are, respectively,

$$(1a) \quad 1 = Y_1^L + Y_1^Q + Y_1^W \quad \text{and}$$

$$(1b) \quad 1 = Y_2^L + Y_2^Q,$$

while the production functions using the youngster's inputs are

$$(2a) \quad Q_1^y = Q_1^y(Y_1^Q) \quad \text{and}$$

$$(2b) \quad Q_2^y = Q_2^y(Y_2^Q, Y_1^W, A_1^W),$$

where Q_1^y and Q_2^y are the youngster's respective childhood and adult outputs. All production functions in the model are quasi-concave, increasing, differentiable, and have the property that $f(0) = 0$. The youngster's lifetime utility function is $U^y(C_1^y, C_2^y, Y_1^L, Y_2^L)$, where the C's indicate quantities of the commodity consumed (while the Q's represent the quantities produced).

The adult parent's first-period supply of human capital can be devoted to leisure, work, the development of his child's skill, or the development of a sense of gratitude in the youngster. The adult's second-period supply of human capital is, more simply, spent on leisure or work. In symbols,

$$(3a) \quad 1 = A_1^L + A_1^Q + A_1^W + A_1^G$$

$$(3b) \quad 1 = A_2^L + A_2^Q,$$

and

$$(4a) \quad Q_1^a = Q_1^a(A_1^Q)$$

$$(4b) \quad Q_2^a = Q_2^a(A_2^Q),$$

where Q_1^a and Q_2^a are the adult's production in periods 1 and 2, respectively. The parent's utility depends on the welfare of the child so that the parent's utility function is $U^a = U^a(C_1^a, C_2^a, A_1^L, A_2^L, U^y(\cdot))$. All of the utility functions are increasing, differentiable, and quasi-concave.

Conservation relationships for the distribution of the consumption commodities are, of course,

$$(5a) \quad C_1^y + C_1^a = Q_1^y + Q_1^a \quad \text{and}$$

$$(5b) \quad C_2^y + C_2^a = Q_2^y + Q_2^a .$$

Finally, none of our individuals can ever have negative commodity consumption or ever devote negative amounts of resources to any activity.

Our assumptions on the natural form of utility independence between parent and child find a decent amount of support from both biological theory and empirical observation. Regarding the biological rationale for making parental utility a function of his child's utility rather than of only certain actions of the child: Since evolved utilities are genetically optimal objectives, there can be no genetic support for a parent's benefitting from his child's private-good actions other than through the effects of such actions on the child's genetic objective. Empirically, wealthy parents, who have little reason to transfer from their children in any form, generally choose broad, essentially unconditional, lump-sum-type transfers to their young adult children over specific subsidies to only a narrow subset of young adult actions. Regarding the asymmetry in the utility functions, wherein the parent is naturally benevolent toward his offspring but not vice versa: Although the survival of a family of higher animals typically requires substantial parental benevolence, this survival is not significantly aided by benevolence of grown children toward their aging parents (Hirshleifer). Empirically, the values of observed voluntary transfers of goods from parents to children far exceeds that from children to parents. In any case, none of our results are razor's-edge-dependent on the assumed form of utility-interdependence. We can relax either one of our assumptions quite significantly before even beginning to affect our conclusions.

One other unusual feature of our technological environment is that a parent may devote resources to train his child to feel grateful toward his parent when the child is grown, and therefore to feel guilty if he does not transfer sufficient resources to his aging parent. This appears to be a pure waste of the society's resources, and, indeed, as we shall soon see, it is such a waste in our model. We include A_1^G in the model because certain institutions of empirical interest will induce parents to adopt positive values while others will induce zero values.

B. Pareto Optimal Childrearing Decisions

The conditions for a Pareto optimum in the above environment are obtained by maximizing the following Lagrangian function subject to the non-negativity constraints:

$$(6) \quad U^y(C_1^y, C_2^y, Y_1^L, Y_2^L) + \mu [U^a(C_1^a, C_2^a, A_1^L, A_2^L, U^y(C_1^y, C_2^y, Y_1^L, Y_2^L)) - U^{a*}] \\ + \lambda_1 [Q_1^y(Y_1^Q) + Q_1^a(A_1^Q) - C_1^y - C_1^a] + \lambda_2 [Q_2^y(Y_2^Q, Y_1^W, A_1^W) + Q_2^a(A_2^Q) - C_2^y - C_2^a] \\ + \gamma_1 [1 - Y_1^L - Y_1^Q - Y_1^W] + \gamma_2 [1 - Y_2^L - Y_2^Q] + \gamma_3 [1 - A_1^L - A_1^Q - A_1^W - A_1^G] + \gamma_4 [1 - A_2^L - A_2^Q].$$

We can assume that the Pareto optimum requires positive consumption by both individuals in both periods and positive amounts of all productive resources to be devoted to all activities except one. The exception involves the employment of A_1^G . The Kuhn-Tucker conditions applicable to this variable in the above maximization problem are

$$(7) \quad \gamma_3 \geq 0, \quad \text{and} \quad A_1^G \gamma_3 = 0.$$

Since γ_3 is the marginal utility of the parent's first-period human capital, the nonsatiation condition on the utility functions implies that

$\gamma_3 > 0$. Therefore, (7) implies that $A_1^G = 0$ in the optimum. Instilling filial loyalty in the child by making him indebted to the parent uses valuable resources, yet the only return is a pure transfer to the parent. As pure transfers are costless within our optimality model, devoting resources to producing these transfers is clearly Pareto nonoptimal.

Setting the first derivatives of (6) with respect to each of the variables other than A_1^G equal to zero yields

$$(8a) \quad \frac{\partial U^y / \partial c_1^y}{\partial U^y / \partial c_2^y} = \frac{\partial U^a / \partial c_1^a}{\partial U^a / \partial c_2^a}$$

$$(8b) \quad \frac{\partial U^y}{\partial Y_1^L} = \frac{\partial U^y}{\partial c_1^y} \frac{dQ_1^y}{dY_1^Q}$$

$$(8c) \quad \frac{\partial U^y}{\partial Y_2^L} = \frac{\partial U^y}{\partial c_2^y} \frac{\partial Q_2^y}{\partial Y_2^Q}$$

$$(8d) \quad \frac{\partial U^y}{\partial c_2^y} \frac{\partial Q_2^y}{\partial Y_1^W} = \frac{\partial U^y}{\partial Y_1^L}$$

$$(8e) \quad \frac{\partial U^a}{\partial A_1^L} = \frac{\partial U^a}{\partial c_1^a} \frac{dQ_1^a}{dA_1^Q}$$

$$(8f) \quad \frac{\partial U^a}{\partial A_2^L} = \frac{\partial U^a}{\partial c_2^a} \frac{dQ_2^a}{dA_2^Q}$$

$$(8g) \quad \frac{\partial U^a}{\partial c_2^a} \frac{\partial Q_2^y}{\partial A_1^W} = \frac{\partial U^a}{\partial A_1^L}$$

These seven equations together with the seven constraint equations represent fourteen generally independent equations which determine the Pareto optimal values of the fourteen variables other than A_1^G , which equals zero.

These conditions are identical to the conventional private-good conditions that arise with no interdependence. This is no surprise. Instead, it reinforces the conventional economic presumption that under pure benevolence, i.e., when utility is for another's utility rather than for his specific activities, a Pareto optimal transfer has no effect on the conventional marginal conditions for allocative efficiency.

C. Property Rights and Privately Optimal Childrearing Decisions

Among the considerations underlying the institutions assumed in this paper is the disadvantage children would suffer if left alone to make certain decisions for themselves. Since superior adult information often cannot be economically communicated to a child prior to decision time, more knowledgeable adults emerge as decisionmakers for the youth. In our model, these adults are the child's natural parents.⁵ After designating the decisionmakers, there remains the problem of specifying their incentive systems, or property rights. Comprehensive private property rights represent a conceivable system. Under such a system, parents would collect remuneration (or avoid assessment) according to the value of the benefits provided for the youngsters. Such extensive private property rights seldom appear though, and their absence probably reflects prohibitive costs

⁵The major empirical presumptions in support of this arrangement are that ordinarily (a) a natural parent's utility depends more heavily on his child's welfare than does the utility of other adults, and (b) a parent's genetic similarity to his child gives him an information advantage regarding the preferences and natural abilities of his offspring. Empirical support for the former presumption is found in the willingness of parents to incur costs of childbirth, which have historically exceeded the costs of adoption. (See, e.g., Atkinson on Bentham, pp. 278-79.)

associated with their delineation and enforcement. Rather, a parent in the real world, and in the model below, has rights to the youth's childhood output but no rights to the child's adulthood output. When the youngster becomes an adult, he acquires all rights to his own resources and their product. The grown offspring may, of course, voluntarily give part of his output to his parent; and it is also possible that the parent will voluntarily transfer a lump-sum to his adult offspring. These possible transfers and the property rights are reflected in the parent's income constraints:

$$(9) \quad \begin{aligned} C_1^a + C_1^y &= Q_1^a + Q_1^y \\ C_2^a + T &= Q_2^a + G, \end{aligned}$$

where T represents a real lump-sum transfer from the parent to the grown youngster, and G a gratuity from the grown youngster to his parent. Although the provision of T uses no net resources, obtaining a positive gratuity from the grown offspring requires a positive level of A_1^G . Of course, $G \geq 0$ and $T \geq 0$. The offspring's adulthood income constraint is

$$(10) \quad C_2^y + G = Q_2^y + T.$$

With these property rights, a parent assigning his child's human capital to leisure or skill development does so at the expense of his own income. This is due to the attendant reduction in the youngster's current output. Similarly, any of the parent's own capital used to develop the child's adulthood work skills decreases the resources available for the parent's immediate gratification. Part of the reward for incurring these costs comes from the parent's psychic association with the benefitted child. Material compensation may also accrue but only if the youngster will feel

indebted to the parent and choose to transfer a larger quantity of his adult output to his elderly parent. Therefore, in considering possible compensation, the parent must anticipate his child's adulthood decision. The problem gains interest because the parent -- given his knowledge and his authority over the youth's childhood activities -- can purposefully affect the offspring's choice of G . For example, promoting childhood work will in general influence the valuation of the grown youngster places on work relative to leisure and thus on his willingness to work to provide goods for his elderly parent. Most generally, the adult offspring's choice of G will depend on arguments in his utility and production functions, arguments which will be parameters from the offspring's standpoint but are currently variables under the parent's control. This means that in anticipating a gratuity from his child, the parent must recognize that all of the variables he controls in the first period may influence G and consider the function:

$$G = G(C_1^a, C_1^y, Y_1^L, Y_1^Q, Y_1^W, A_1^L, A_1^Q, A_1^W, A_1^G).$$

Using the first period conservation equations, (1a), (3a), and (5a), this can be simplified to:

$$(11) \quad G = G[C_1^y, Y_1^Q, Y_1^W, A_1^Q, A_1^W, A_1^G] = G[x],$$

where the partial derivatives of $G[x]$ are computed from $G(\cdot)$ by varying the omitted variables when it is necessary to satisfy the conservation equations. While these derivatives can be assumed to be non-zero for positive values of A_1^G , they are also zero when $A_1^G = 0$. For when $A_1^G = 0$, $G = 0$ regardless of the values of the other variables. Gratitude can be instilled only by teaching it; but once taught, it can be exploited in many ways.

As an adult, the offspring will choose, besides G according to the G -function described above, the values of three variables, C_2^Y , Y_2^L , and Y_2^Q . This choice, $(C_2^{Y*}, Y_2^{L*}, Y_2^{Q*})$, can be found by varying the three values so as to maximize

$$(12) \quad U^Y(C_1^Y, C_2^Y, Y_1^L, Y_2^L) + \lambda^Y [Q_2^Y(Y_2^Q, Y_1^W, A_1^W) + T - G[x] - C_2^Y] + \gamma^Y (1 - Y_2^L - Y_2^Q).$$

Assuming that this choice entails positive values for all three variables, it is easily shown to be characterized by equation (8c) above, along with the two constraint equations implied in (12). The resulting value of U^Y is written $U^Y[x]$. For the purpose of future demonstrations, we note that since $C_2^{Y*} > 0$, the maximization in (12) implies that

$$(13) \quad \frac{\partial U^Y}{\partial C_2^Y} = \lambda^Y = \frac{\partial U^Y[\cdot]}{\partial T} = \frac{-\partial U^Y[\cdot]}{\partial G}.$$

We can now represent the parent's utility-maximizing decision as one which, in view of the $U[x]$ and $G[x]$ functions, uses the six first-period variables in x and (C_2^a, A_2^L, A_2^Q, T) to maximize the Lagrangian expression,

$$(14) \quad U^a(Q_1^a(A_1^Q) + Q_1^Y(Y_1^Q) - C_1^Y, C_2^a, 1 - A_1^Q - A_1^W, A_1^G, A_2^L, U^Y[x]) + \\ \lambda^a [Q_2^a(A_2^Q) + G[x] - T - C_2^a] + \gamma^a [1 - A_2^L - A_2^Q].$$

The solution is written as $(x^*, C_2^{a*}, A_2^{L*}, A_2^{Q*}, T^*)$. The respective Kuhn-Tucker conditions with respect to T and A_1^G are, using the parent's optimality condition for C_2^a , so that $\lambda^a = \partial U^a / \partial C_2^a$,

$$(15) \quad \frac{\partial U^a}{\partial U^Y} \cdot \frac{\partial U^Y}{\partial T} - \frac{\partial U^a}{\partial C_2^a} \leq 0; \quad T^* \left[\frac{\partial U^a}{\partial U^Y} \cdot \frac{\partial U^Y}{\partial T} - \frac{\partial U^a}{\partial C_2^a} \right] = 0 \quad \text{and}$$

$$(16) \quad \frac{\partial U^a}{\partial U^y} \frac{\partial U^y}{\partial A_1^G} + \frac{\partial U^a}{\partial C_2^a} \frac{\partial G}{\partial A_1^G} - \frac{\partial U^a}{\partial A_1^L} \leq 0; \quad A_1^{G*} \left[\frac{\partial U^a}{\partial U^y} \frac{\partial U^y}{\partial A_1^G} + \frac{\partial U^a}{\partial C_1^G} \frac{\partial G}{\partial A_1^G} - \frac{\partial U^a}{\partial A_1^L} \right] = 0.$$

It follows, as we shall now show, that T^* and A_1^{G*} cannot both be positive. Using (13), we can rewrite (15) as:

$$(15') \quad \frac{\partial U^a}{\partial U^y} \frac{\partial U^y}{\partial C_2^y} - \frac{\partial U^a}{\partial C_2^a} \leq 0; \quad T^* \left[\frac{\partial U^a}{\partial U^y} \frac{\partial U^y}{\partial C_2^y} - \frac{\partial U^a}{\partial C_2^a} \right] = 0.$$

We can also rewrite (16), using the fact that $\partial U^y / \partial A_1^G = (\partial U^y / \partial G)(\partial G / \partial A_1^G)$ and (13), as

$$(16') \quad - \frac{\partial U^a}{\partial U^y} \frac{\partial U^y}{\partial C_2^y} + \frac{\partial U^a}{\partial C_2^a} \leq \frac{\partial U^a}{\partial A_1^L} / \frac{\partial G}{\partial A_1^G}; \quad A_1^{G*} \left[\frac{\partial U^a}{\partial U^y} \frac{\partial U^y}{\partial C_2^a} - \frac{\partial U^a}{\partial C_2^a} + \frac{\partial U^a}{\partial A_1^L} / \frac{\partial G}{\partial A_1^G} \right] = 0.$$

In view of the second part of (15'), if $T^* > 0$, $(\partial U^a / \partial U^y)(\partial U^y / \partial C_2^y) = \partial U^a / \partial C_2^a$. Substituting this equation into the second part of (16'), we see that the multiplicand of A_1^{G*} then reduces to $(\partial U^a / \partial A_1^L) / (\partial G / \partial A_1^G)$, which by our prior assumptions, is always positive. It follows that A_1^{G*} , and thus G^* , must be zero. So $T^* > 0$ implies $G^* = 0$.

Thus, if G^* is positive, then T^* must be zero. T^* and G^* cannot be both positive. No rational parent will both develop an inefficient sense of filial loyalty in his children and plan to give them lump-sum transfers.

To describe the remainder of the parent's maximization in (14) in terms of our basic behavioral functions, we must first identify the derivatives of $U^y[x]$ resulting from the grown offspring's rational decisions.

Differentiating the maximizing solution to (12), which equals $U^y[x]$ when the youngster optimizes, by the respective arguments of x and using (13), we obtain

$$(17a) \quad \frac{\partial U^y[\cdot]}{\partial c_1^y} = \frac{\partial U^y(\cdot)}{\partial c_1^y} - \frac{\partial U^y}{\partial c_2^y} \cdot \frac{\partial G[\cdot]}{\partial c_1^y}$$

$$(17b) \quad \frac{\partial U^y[\cdot]}{\partial Y_1^Q} = \frac{-\partial U^y(\cdot)}{\partial Y_1^L} - \frac{\partial U^y}{\partial c_2^y} \cdot \frac{\partial G[\cdot]}{\partial Y_1^Q}$$

$$(17c) \quad \frac{\partial U^y[\cdot]}{\partial Y_1^W} = \frac{-\partial U^y(\cdot)}{\partial Y_1^L} + \frac{\partial U^y}{\partial c_2^y} \left(\frac{\partial Q_2^y}{\partial Y_1^W} - \frac{\partial G[\cdot]}{\partial Y_1^W} \right)$$

$$(17d) \quad \frac{\partial U^y[\cdot]}{\partial A_1^Q} = \frac{-\partial U^y}{\partial c_2^y} \cdot \frac{\partial G[\cdot]}{\partial A_1^Q}$$

$$(17e) \quad \frac{\partial U^y[\cdot]}{\partial A_1^W} = \frac{\partial U^y}{\partial c_2^y} \left(\frac{\partial Q_2^y}{\partial A_1^W} - \frac{\partial G[\cdot]}{\partial A_1^W} \right)$$

$$(17f) \quad \frac{\partial U^y[\cdot]}{\partial A_1^G} = \frac{-\partial U^y}{\partial c_2^y} \frac{\partial G[\cdot]}{\partial A_1^G}$$

Using these equations, the remaining first-order conditions for the parent's maximization problem are easily seen to be

$$(18a) \quad \frac{\partial U^y / \partial c_1^y}{\partial U^y / \partial c_2^y} = (1+E) \frac{\partial U^a / \partial c_1^a}{\partial U^a / \partial c_2^a} - E \frac{\partial G[x]}{\partial c_1^y}$$

$$(18b) \quad \frac{\partial U^y}{\partial Y_1^L} = (1+E) \frac{\partial U^y}{\partial c_1^y} \frac{\partial Q_1^y}{\partial Y_1^Q} \left(\frac{\partial U^a / \partial c_1^a}{\partial U^a / \partial c_2^a} \cdot \frac{\partial U^y / \partial c_2^y}{\partial U^t / \partial c_1^y} \right) + E \frac{\partial U^y}{\partial c_2^y} \frac{\partial G[x]}{\partial Y_1^Q}$$

$$(18c) \quad \frac{\partial U^y}{\partial c_2^y} \frac{\partial Q_2^y}{\partial Y_1^W} = \frac{\partial U^y}{\partial Y_1^L} - \frac{\partial U^y}{\partial c_2^y} \frac{\partial G}{\partial Y_1^W} E$$

$$(18d) \quad \frac{\partial U^a}{\partial A_1^L} = \frac{\partial U^a}{\partial C_1^a} \frac{\partial Q_1^a}{\partial A_1^Q} + \frac{\partial U^a}{\partial C_2^a} \frac{\partial G}{\partial A_1^Q} \left(\frac{E}{(1+E)} \right)$$

$$(18e) \quad \frac{\partial U^a}{\partial C_2^a} \frac{\partial Q_2^y}{\partial A_1^W} = \frac{\partial U^a}{\partial A_1^L} (1+E) - \frac{\partial U^a}{\partial C_2^a} \frac{\partial G}{\partial A_1^W} E \quad \text{and}$$

$$(18f) \quad \frac{\partial U^a}{\partial A_2^L} = \frac{\partial U^a}{\partial C_2^a} \frac{\partial Q_2^a}{\partial A_2^Q}$$

where

$$(18g) \quad \frac{\frac{\partial U^a}{\partial C_2^a} \frac{\partial U^a}{\partial C_2^a} \frac{\partial U^y}{\partial C_2^y}}{\frac{\partial U^a}{\partial U^y} \frac{\partial U^y}{\partial C_2^y}} = E.$$

From (15), we know that $E \geq 0$ and that $E = 0$ when $T^* > 0$.

D. Comparing Pareto Optimal and Privately Optimal Childrearing Decisions

First, consider the case in which $T^* > 0$. Since $E = 0$ and $A_1^{G^*} = 0$, so that the above derivatives of $G[x]$ are all zero, (18 a-f) simplifies to a set of equations which, when combined with the grown offspring's marginal condition, (8c), is identical to the set of marginal conditions for Pareto optimality expressed in (8a-g).

Since the sum of the adult's and youngster's budget constraints expressed in (8) and (9) are identical to the social conservation conditions in (5), the private system satisfies all of the conditions of a Pareto optimal system. The only difference between our two systems is that while equation (18g) with $E = 0$ and the additional budget constraints for the

period are used to determine T and thus the distribution of utility in the private system, an arbitrarily given, $U^a = U^{a*}$, constraint was used to determine the utility distribution in the system used to compute a Pareto optimum. Of course, we could set U^{a*} equal to the private system's solution level and thus obtain an equivalency between the two solutions, but we shall see in Section IV.C.2 that the parentally chosen intergenerational distribution of utility is never the distribution that maximizes a utilitarian social welfare function.

Nevertheless, summarizing the results for the first case: Parents who plan to give conditional gifts to their grown children make Pareto optimal childrearing decisions even though they receive no material compensation for their contribution to the child's development.

We now examine the general case in which $T^* = 0$. Even with parents' sufficiently benevolent that $A_1^{G^*} = G^* = 0$, parental choices will still be generally Pareto nonoptimal. For with $T^* = 0$, it may easily be, from (15) and (18g), that $E > 0$. That is, even though the parent is sufficiently benevolent that he does not devote resources to developing filial gratitude in his child so as to obtain support later in life, he may still not be sufficiently benevolent to be indifferent between his grown offspring's consumption and his own future consumption. Then, while four of the seven marginal conditions for Pareto optimality are satisfied, since (18c,d,f) is equivalent to (8d,e,f) when $A_1^{G^*} = 0$ and the adult youngster's optimality condition is equivalent to (8c), three Pareto conditions are not satisfied. In particular, conditions (18a,b, and c) become, respectively,

$$(18a') \quad \frac{\frac{\partial U^y}{\partial C_1^y}}{\frac{\partial U^y}{\partial C_2^y}} = (1+E) \frac{\frac{\partial U^a}{\partial C_1^a}}{\frac{\partial U^a}{\partial C_2^a}}$$

$$(18b') \quad \frac{\partial U^y}{\partial Y_1^L} = (1+E) \frac{\partial U^y}{\partial C_1^y} \frac{\partial Q_1^y}{\partial Y_1^Q} \frac{\frac{\partial U^y}{\partial C_2^y}}{\frac{\partial U^a}{\partial C_2^a}} \cdot \frac{\frac{\partial U^a}{\partial C_1^a}}{\frac{\partial U^y}{\partial C_1^y}}$$

$$(18e') \quad \frac{\partial U^y}{\partial C_2^a} \frac{\partial Q_2^y}{\partial A_1^W} = (1+E) \frac{\partial U^a}{\partial A_1^L}$$

In view of (8a), (18a') describes a parental undervaluation of his young child's consumption relative to his own consumption. If childhood consumption is improved so that (18a') is replaced with the optimality condition (8a), (18b') describes a parental overvaluation of his child's working rather than enjoying leisure. Lastly, (18e') describes a parental undervaluation of investments of his own resources in his child's education.

Consequently, an economic policy that obviously suffices to remove these three inefficiencies in the private system is one that provides for minimum childhood consumption, maximum childhood labor, and minimum parental expenditures for the education of his child. We will discuss this policy further in Section II of this paper.

The third and final possible parental solution has $A_1^{G*} > 0$. The additional positive variable is matched by the extra equation described by the second part of (16). Using (17f) and (18g) this equation amounts to

$$(18h) \quad \frac{\partial U^a}{\partial U^y} \frac{\partial U^y}{\partial C_2^y} \frac{\partial G}{\partial A_1^G} \cdot E = \frac{\partial U^a}{\partial A_1^L}$$

The resulting private system, (18a-h) and (8c), is an allocative disaster. All of the first-period efficiency conditions are violated as the G-derivatives are all non-zero, and this occurs in addition to the fact that the coefficients of the positive E's imply the allocative inefficiencies already discussed. Moreover, neither A_1^G nor its highly variable effects are observable.

Even the control of the observable variables is made highly complex. For one small example, the new interpretation of the first condition is that not only does the parent lack the benevolence to grant his youngster a sufficient amount of consumption relative to his own, but, to facilitate the later, second-period transfer from his grown children, he also has the child underconsume to prevent the youngster from developing habits of luxurious consumption (i.e., it is plausible that $(\partial G[\cdot])/\partial C_1^y < 0$.) Since the latter effect is both highly unobservable and unique to a given family, it is difficult to devise a curative policy.

II. INSTITUTIONS ALTERING PARENTAL INCENTIVES

Considering the above results, assuming first that $A_1^G - G = 0$, the most immediate policy suggestion would be to identify those parents for whom $T^* = 0$ and then to institute a tax/subsidy program that makes their solution equations satisfy the optimality conditions. This would include taxing or subsidizing all of the decision variables of parents with young children. Realistically, such taxes would depend significantly on the magnitude of E, which is highly unobservable. Such an approach therefore faces severe implementation problems, in addition to the obvious one of

setting up a personally tailored, discriminatory tax-subsidy system. An alternative set of policies, based on an a priori physical similarity of one child to another and the theoretical observation that parents who give lump-sum transfers to their children adopt Pareto optimal quantities, involves dictating minimum standards to parents.^{6,7} This latter approach closely resembles the arrangements we commonly observe. We identified such a set above for the case in which $G^* = 0$, the set comprised of compulsory education, anti-child labor, and minimum child consumption laws. The standards, of course, are obtained by discovering the efficient choices of those parents for whom it is observed that $T^* > 0$. But optimal policy for the case in which insufficiently benevolent parents also have $G^* > 0$ is much more difficult because neither A_1^G nor the several derivatives of $G(\cdot)$ are practically observable.

Nevertheless, the myriad of parental misallocations during his child's youth due to the positivity of G^* can be dealt with by rendering insignificant the parent's economic incentives to train filial gratitude into their children. We believe that compulsory participation in an old age pension program accomplishes this. Such a system forces insufficiently benevolent parents to save for their old age and thereby prevents them from

⁶If the observed sample of parents for whom $T^* > 0$ is unavoidably wealthier than the parents for whom $T^* = 0$, a downward adjustment must be made in these quantity standards to reflect the correspondingly lower expected wealths of the children with parents for whom $T^* = 0$.

⁷If the model were generalized to admit non-quasi-concave functions, then there would be a general superiority of quantity controls over a tax-subsidy system even if there were no costs of discovering the appropriate tax rates and the tax system. For, unlike voluntary exchange systems such as the free market, Pigovian tax systems do not enable all of the affected parties to freely choose quantities under the fixed tax rates and therefore permit equilibria in which local but not global optimality conditions are satisfied (See Thompson-Batchelder).

overconsuming during pre-retirement years so as to gain subsistence support from sympathetic offspring upon retirement. Without this technique for inducing transfers it is unlikely that parents can acquire significant income from their grown children. We are led to this belief by the observation, albeit casual, that the only empirically important transfers from grown offspring to their parents are transfers providing normal subsistence to elderly parents who otherwise would suffer in destitution or ill-health. We seldom observe grown children supporting lavish improvements in the standard of living of their aging parents. Thus it seems likely that, for many families, a social security-medicare system depresses the productivity of gratitude training to a point where the induced equilibrium level of A_1^G is zero.

In fact, the benefits paid by the U.S. social security-medicare program approximates old age subsistence. While parents for whom $T^* > 0$ also participate in the social security program, this is inconsequential: With planned bequests, such people normally have sufficient assets that they can easily borrow against these assets in order to offset their social security payments and achieve the same lifetime consumption pattern they would elect in the absence of their social security participation. A similar argument applies to childless parents, who have little choice but to save in some fashion for their old age. Only parents lacking sufficient assets to support a bequest, i.e., parents for whom $T^* = 0$, are affected by the social security-medicare system. The system thus appears to be a remarkable device for selecting out those parents for whom $T^* = 0$ and forcing them to save just sufficiently that they will not burden their grown children in their old age. Accordingly, we assume the system induces $G = 0$.

Since, even if $G = 0$, parents who do not plan to give their recently grown-up children lump-sum transfers will generally underprovide their own resources to the training of their children as well as force childhood underconsumption and overwork on their youngsters, policies of compulsory childhood education, anti-child labor, and anti-child abuse laws are still required to theoretically eliminate the corresponding inefficiencies.

As quantity restrictions are avoidable by various parentally determined quality reductions, additional intervention may be justified. Regarding education, public production serves to ameliorate these problems. At the same time, it works against parents for whom the social security system does not fully prevent the overdevelopment of filial loyalty, which could be promoted and exploited through the educational system.⁸ The provision of free public education also adds to the ease of enforcing quantity restrictions. Indeed, as noted in footnote 2, the subsidy may have worked in the U.S. to the extent that quantity restrictions have been largely redundant. However, as pointed out by Buchanan, the replacement of a simple quantity

⁸Consistent with this argument is the casual observation that much of parents' discontent with local school curricula focuses on programs which can be regarded as augmenting the students' leisure to the neglect of developing the children's marketable skills.

The quality restrictions on schools attended by youngsters from wealthy families is not implied by the analysis in this paper, nor is the unavailability of voucher systems to wealthy families. The presence of only incomplete laissez faire educational policy in wealthy areas may be explained by recognizing the existence of some inappropriabilities outside of the family. With these property right imperfections, a parent acting in his child's best interests would educate him to disregard the consequences of actions for which he is not compensated or charged. Since these property right imperfections lead benevolent parents to overvalue childhood training which teaches the child to recognize only his compensated actions, achieving a social optimum involves discouraging such training. While a parent would otherwise choose to send his child to a private school which does not adequately develop a sense of social responsibility, the availability of quality-restricted public schools with zero tuition serves to appropriately tax of enrollment in those private schools.

restriction with free public education of a given quality amounts to a fixed payment for having a child, a subsidy to childbearing. A variable rate of childbearing will be introduced into our analysis in Section III below, where it will be seen that such a subsidy is indeed necessary for optimality given our other policies.

Regarding childhood consumption standards, numerous social workers in the U.S. regularly press poor, welfare-dependent families to improve the quality of housing and food consumed by the children instead of spending their welfare income on adult-specific consumption goods. Finally, while child labor laws are normally fairly easily and uniformly enforced for younger children, quantity restrictions are impractical for older, teenage, children owing to the substantial variations in their abilities. For these children, we have observed the evolution of minimum-wage laws as part of our general child labor law. Such laws have the desirable effect of preventing low productivity teenagers from working while allowing more productive teenagers a few hours of labor. For those exceptional children, such as those in the entertainment field, who are clearly not protected by the minimum wage, a special law, the "Coogan Law," has evolved in the U.S. This law forces the parent to dedicate most of his youngster's income to a trust for the child's benefit, thereby substantially reducing the overvaluation of a youngster's high-income labor by insufficiently benevolent parents while having no substantial effect on the choices for those parents for whom $T^* > 0$.

More refined analyses, dealing with particular forms of undereducation and underconsumption, can be developed. For example, parents for whom $T = 0$ generally undervalue high-quality pre-schools (V. Thompson, 1977), and buy their youngsters an overly low quality of entertainment.

III. A PARETO OPTIMAL POPULATION

The above model has a fairly straightforward application to the important, but historically neglected, issue of a Pareto optimal population. Allow the model's first period to include a pre-birth state in which the "youngster" or "offspring," is simply a group of living cells, perhaps just separate sex cells. If the "parent" does not devote resources above a critical level, A_1^W , to developing the "youngster's" future, then we can say that the "youngster" remains "unborn" and the corresponding "population" is lower than if $A_1^W > A_1^W$. Such a parental choice results in negligible output and consumption levels for the "unborn youngster." Thus, a Pareto optimal level of "childbearing" and "population" is equivalent to a Pareto optimal choice of A_1^W .

Applying our central optimality result, if parents have sufficient benevolence that they transfer lump-sums to their grown youngsters, then they will choose Pareto optimal levels of A_1^W for their youngsters and, therefore, a Pareto optimal population, or quantity of born youngsters. Intuitively, sufficiently benevolent parents will bear a Pareto optimal number of children because they bear a child when and only when they estimate that their youngster's utility is higher in a born than an unborn state, taking compensation for their childbearing expenditures out of their lump-sum transfers to the born youngsters when they become adults.⁹

⁹ A problem arises in that while we observe certain types of parents transferring lump-sums to their born offspring, we, of course, do not observe transfers to unborn "offspring." This suggests that parental benevolence may be limited to born offspring, so that the parent may make decisions that are insensitive to reductions in the utility of his unborn "offspring." While any offspring's increment in utility from being born is included in the model because adult sensitivity to the utility of a born offspring carries with it a sensitivity to the net utility that the offspring would receive from being born and living as a person, preferences that unborn "offspring" have between alternatives arising for them in their

But where lump-sum transfers to grown youngsters are not observed, childbearing and population are generally Pareto nonoptimal. Two special cases are of particular interest. First we consider the case in which a social security system, child labor laws, anti-child-abuse laws, and compulsory elementary education laws exist. This corresponds fairly closely to a policy set observed in virtually all developed countries of the world. Applying our results for the corresponding $G^* = 0$ case, an adult for whom $T^* = 0$ generally undervalues childbearing, as shown in equation (18e'). With no quantity minimum set on A_1^W for the act of childbearing, i.e., no quantity minimum on childbearing, there will generally be an underprovision of human offspring. Since childbearing minima are clearly impractical due to the large and unknown differences in the parental costs of childbearing and childrearing, a regressive subsidy is in order. In fact, we observe a heavy subsidy of this kind in most developed countries in that the compulsory level of education for the poor is entirely financed by the government.

The second case of interest arises in environments containing no social security system, no child labor law, no child abuse law, and no compulsory education law. This applies to most pre-industrial societies, past and present. In this case, while the first term on the right of (18e) still indicates a tendency toward an undervaluation of A_1^W and thus of childbearing, the now-relevant second term on the right of (18e) indicates a counter-tendency toward the overvaluation of childbearing, since the term

given, unborn state, say aborted children, are being ignored. If, for example, parents who give their born children lump-sum transfers are observed to have lots of aborted children, we could not infer a Pareto optimal ratio of conception to abortion for this family. Even with sufficient extra-familial benevolence toward these unborn offspring, this problem could not be solved by the policy suggested in this paper. The conception and abortion practices of the upper middle class, even if they were known, would provide no simple quantity guide for the poorer classes.

$\partial G[x]/\partial A_1^W$ is now positive. Evidence for the quantitative importance of the latter effect is the widespread belief that some poor societies are overpopulated because the private profitability of having his last child outweighs the parent's disutility of generating a child that lives in such a miserable state. However, even if we knew that it was, in fact, profitable to have a child, the second-best nature of the problem, due to the fact that several necessary conditions for Pareto optimality are violated, would prevent us from inferring unambiguous overpopulation in these societies.

IV. DEMOCRATIC ALLOCATION

A. The Theory in the Absence of Deficit Financing

Although the potential inefficiencies resulting from the absence of private property rights in the value of childrearing decisions apparently explain a number of observed public policies, there remains the question of how the political process has generated these qualitatively efficient institutions. While Pareto optimality can be understood as a positivistic concept, a force theoretically as well as empirically guiding political decisions in response to citizens' interests (Thompson [1971], [1979], Thompson-Faith [1981], Becker, [1983]), why would politicians formulate programs to aid youngsters who have no current political power? They would if present adults could later tax the grown young for the assistance provided earlier. Of course, a dictator could impose such charges on younger adults and achieve our Pareto optimum. However, a democracy lacks the institutional arrangements to enforce such deferred charges, because when the young adults become subject to the compensatory levies, they can repudiate them by a simple vote. An indirect mechanism, working simultaneously through government investment and deficit financing, does exist,

but we shall carry out the first part of this argument assuming that the government is "financially immature" in that a policy of peacetime deficit financing is simply not available to the government.¹⁰

Thus, given that each adult lacks benevolence except toward his own offspring, an internally efficient democratic state without deficit financing will not respond to the above Pareto nonoptimalities. As such a state adopts institutions that are jointly efficient only among current voters, no element of our optimal policy set will be adopted, and the young will suffer the same neglect of their preferences in the political arena that they suffer in a laissez faire system.

We now relax the unrealistic assumption that individuals are benevolent only toward their own offspring, and in place of that assumption, we introduce a slight amount of benevolence by each voting adult for others outside their own families. (A biological basis for this preference is the positi-

¹⁰It would be incorrect to regard social security as a deficit financing system, which is purely redistributational (Thompson, 1967). Whereas the standard deficit financing system has its debt voluntarily purchased by natural, low-time preference, liquid lenders, a social security system, by forcing lending on individuals who are not natural, liquid lenders, forces an increase in savings and decrease in utilities at given wealths for these high-time-preference individuals. Of course, as we have already argued, the apparently perverse effect that social security has in forcing savings is what qualifies it for membership in our set of Pareto optimal policies.

That the consumption of individuals who plan to leave bequests is not affected by social security or a tax-financed increase in national debt (even when inter-generational redistributions result) has been recently emphasized by Barro. However, he goes too far by claiming that essentially all individuals are this benevolent and, accordingly, that there should never be any real effect of deficit financing with perfect capital markets. This peculiar claim stems from the incorrect argument that the observed, universal parental support of their children's education implies sufficient benevolence that the parents are willing to transfer lump-sums to their children. This error is also pointed out in recent papers by Drazen and Adams. Correcting Barro's mistake leads back to the more standard approach to deficit financing under rational expectations (e.g., Thompson [1967]) and also raises the question of why we tolerate the apparent inefficiencies of a social security system, an issue addressed in the present paper.

vity of the probability that any particular youth of one's species is a genetic relative. See, for example, Hamilton.) This change has several implications for the model.

First, the presence of such benevolence establishes aid to children as a collective good. For both the parent and the adults outside of a child's family simultaneously benefit from his support. Assuming that several adults possess such benevolence, the familiar argument favoring public provision which runs in terms of the high exclusion or contract costs of private provision, takes hold. It then becomes reasonable that governmental support of investments benefiting children would occur in an efficient democratic state. This is not the conventional economic argument for public provision of education, viz., that "education is a public good." Without private underprovision due to parental malincentives, there would be no reason for public support of education.

Second, extra-familial benevolence, no matter how small, implies that there will always be net social gains to adults from transferring in kind to children more than is in the self-interest of the parent. The reason is a simple application of our model of parental allocation: A rational parent sacrifices for his child until another dollar of sacrifice brings the parent additional psychic benefits whose value to the parent is less than a dollar by some arbitrarily small amount, say δ . But if the increase in the child's utility resulting from the one-dollar expenditure confers on each individual outside the family a given, positive amount of benefits, with the amounts summing to, say, 10¢, then they will clearly benefit by supporting

the additional expenditure for the child. For 10¢ exceeds δ .¹¹

Even if the outsiders have a somewhat higher collective marginal utility for the utility of the adults -- because, e.g., children have a greater expected wealth than their parents -- the in kind transfer will still go to the children.¹² For extra-familial transfers to children are complemented by significant transfers from parents but not vice versa. In the above example, the 10¢ maximum contribution from the outsiders is matched by a $\$1-\delta$ contribution from the parent. Even if the outsiders preferred a transfer to the adults nine times as much as a transfer to their children, their willingness to contribute 90¢ towards a $\$1.00$ transfer to

¹¹Since it is not plausible that significant extra-familial benevolence toward children of the wealthy exists, the above argument should concentrate on the children of nonwealthy parents. Because children of nonwealthy parents are the only reasonable potential victims of the parental malincentives, the fact that extra-familial benevolence toward the wealthy is extremely weak does not disturb our argument. Direct collective transfers to the children of the wealthy are impossible anyways because parents will rationally respond by privately offsetting any governmental transfer from them to their children. Their children can be publically benefitted only by making the entire wealthy family better-off and thereby increasing their desired lump-sum transfer to their children.

¹²This contradicts the widely accepted result of Sen [1961, 1967]. Sen's result relies on an assumption that adults will vote to collectively transfer an extra dollar to children if and only if each adult's positive increment in utility from the transfer exceeds his decrement in utility from seeing the other adults lose their share of the dollar transfer. This assumption implies that each adult believes that the other contributing adults lose utility when they lose money. In fact, there is a component of utility gain to these parents, because they too benefit from the transfer to youth. In the democratic equilibrium, this component of utility gain equals the utility loss from the monetary transfer. Thus Sen's condition, adjusted to reflect correct beliefs on the part of the utility-interdependent adults, reads: adults will vote to transfer an extra dollar to children if and only if each adult's change in utility from the transfer exceeds zero. This is essentially the condition of Marglin. However, neither Marglin nor Sen recognize the parental malincentive problem. Consequently they fail to recognize that educational subsidies and other non-lump-sum policies of redistribution -- policies already in existence -- take priority over savings subsidies. Furthermore, they do not use Pareto optimality as an optimality standard and hence do not recognize the weaknesses of simple democracy that we are about to point out.

adults would go unmatched by other contributions, and so the transfer would not occur.

Finally, the higher level of investment due to extra-familial benevolence may still fall short of the Pareto optimal level. Essentially the same problem that occurs with respect to private parental provision arises in the case of collective provision: The collective benevolence of the adult generation may be insufficient. This result can be obtained as a straightforward extension of our basic model in Section I by simply replacing the "parent" in that model with the collection of all adults. The corresponding central optimality result is that the collectively chosen allocation of resources is Pareto optimal if lump-sum transfers to younger generations are part of the rational collective choice. If such transfers are not observed, then there will generally be a collective underevaluation of the benefits of investments for children, and either a deficit financing system or an authoritarian government will be required for the attainment of a Pareto optimum. Again, the advantage of the authoritarian solution is that the dictator or judge can force the young to compensate their elders for investing in them when they were children and thereby satisfy Pareto conditions that democracy cannot.

The absence of observed, unconditional, collective subsidies to young adults -- especially when contrasted to the frequently observed private transfers by live wealthy parents to their young adult offspring -- indicates that there does not exist sufficient collective benevolence for internally efficient modern democracies without a deficit financing system

to produce Pareto optimal allocations.¹³ Theoretical as well as empirical arguments for the internal efficiency of democratic systems are found in Thompson (1979) and Thompson-Faith (1981). The current paper itself has provided evidence for democracy's internal efficiency in systematically mitigating parental malincentives. So, accepting the internal efficiency hypothesis, recognizing the absence of observed, collective lump sum transfers to young adults, and following Section II in assuming that social security has worked to make $G^* = 0$,¹⁴ our theoretical analysis implies that democratic governments that eschew peacetime deficit financing overwork, undernourish, and undereducate their children.

B. Preliminary Tests

The above hypothesis implies that investment in children, unlike other investment, is substantially affected by the extent of benevolence in a nonauthoritarian society without a system of peacetime deficit financing.

¹³While collective "bequests" via inheritance and estate taxes are observed, these can hardly be considered voluntary transfers by the elderly. Also, these taxes clearly are not lump-sum as they are notoriously avoidable. Inheritance, estate, and gift taxes are perhaps best viewed as part of a system of efficient, non-lump-sum capital taxes based on a national defense externality (Thompson [1974]). Voluntary, benevolent transfers from adults to children come when the child becomes a young adult, the least liquid part of the child's life and a highly liquid part of the parent's life. This holds for public as well as private transfers. The absence of observed government programs of unconditional grants to young adults is what reveals the insufficiency of collective benevolence, even in our wealthiest countries.

¹⁴The fact that we have recently observed steady growth in the national debt as well as social security in many countries indicates that the elderly have typically been able to command governmental redistributions to the point of exploiting all of the allocational advantages of the social security transfer mechanism. For they would not adopt the relatively lump-sum method of deficit financing (see fn. 10) if substantial allocative improvements were available by using the non-lump-sum system. If we did not observe some occasional growth in the national debt, we would have little faith in the assumption that social security has expanded to the point that $G^* = 0$. Nevertheless, we continue to assume the absence of a regular of regular deficit financing to keep issues separate.

Observed expenditures on primary and secondary education should, therefore, historically vary much more closely with aggregate charitable transfer payments than observed expenditures on other investments. An indication is obtained by regressing the fraction of U.S. income historically devoted to elementary education against the fraction of U.S. income historically devoted to charitable transfers, and comparing the resulting regression coefficient to that obtained by regressing the fraction of U.S. income devoted to nonhuman investment expenditures against the fraction of U.S. income devoted to charitable transfers. Using a logarithmic specification, these coefficients can be interpreted as benevolence elasticities. While the benevolence elasticity of nonhuman investment expenditure is expected to be near-zero and statistically insignificant, the benevolence elasticity of primary and secondary education expenditures is expected to be significantly positive and close to unity, given the observed absence of collective lump-sum transfers to young adults. The results of our regression analysis for a period mostly preceding our system of regular deficit financing, viz, 1890 to 1975, are reported below.¹⁵ (The sources and methods used to construct these time series are described in Appendix A.) While the overall results help confirm our theory by indicating that U.S. elementary education has been historically much more significantly determined by the extent of our societal benevolence than is other U.S. investment, the pattern was not apparent when we used only post 1950's data, indicating a recent break-down in the historical relationship.

¹⁵ Similar results were obtained with specification using the data in original, nonlogarithmic form and omitting subsets of variables.₂ The dummy variables and logarithmic forms reported below increased the R^2 and Durbin-Watson statistics.

<u>Variable</u>	<u>Constant</u>	<u>LN (Charitable Transfers + GNP)</u>	<u>(Dummy for late Depression)</u>	<u>Dummy for WWII</u>	<u>LN(Pop. Age for 5-17 + Pop.)</u>	<u>R²</u>	<u>D.W.</u>
LN (Current Elem. & Sec. Ed., Expend. + GNP)	-6.59	+0.91	-0.32	-0.40	+2.00	0.93	1.38
	(-7.26)	(14.29)	(-7.76)	(-4.11)	(7.19)		[1.31]
LN (Invest. + GNP)	+5.11	-0.06	-0.26	-1.20	-0.75	0.34	1.42
	(1.31)	(0.23)	(1.47)	(2.91)	(0.63)		[1.39]

- NOTES: 1. Dummy for Late Depression Years = 1 for 1934, 1936, 1938, 1940 = 0, otherwise.
2. t-values are shown in parentheses below coefficients.
3. Bracketed number is D.W. statistic adjusted for 2 gaps in data.

Second, since authoritarian societies are free from the democratic constraints discussed above, our analysis does not imply any systematic underinvestment for children in such societies. Thus the above analysis suggests that a relatively more authoritarian and less democratic government has a higher expected level of investment for the benefit of its children. To test this implication we ran two logarithmic regressions using a fairly recent international cross section sample of 91 countries. Following our theory, the first regression made the fraction of a country's population represented by child laborers depend on (a) the country's per capita income, (b) an index of the degree of political freedom, or "democracy," of the country and (c) the multiplicative interaction of per capita income and democracy. The second regression equation made each country's per capital educational expenditures depend on the same set of independent variables. (The data sources are described in Appendix B.) The results are as follows:

$$\text{LN } \frac{\text{Child Labor}}{\text{Pop.}} = .40 - .08 \text{LN } \frac{\text{GNP}}{\text{Pop}} + .20 \text{LN Dem.} - .22 \times 10^{-5} \frac{\text{GNP}}{\text{Pop}} \times \text{Dem.}$$

(0.97) (-1.20) (3.69) (-2.77)

$$\text{LN } \frac{\text{Ed. Expend.}}{\text{Pop.}} = 4.14 + 1.16 \text{LN } \frac{\text{GNP}}{\text{Pop}} - .03 \text{LN Dem.} + .66 \times 10^{-6} \frac{\text{GNP}}{\text{Pop}} \times \text{Dem.}$$

(13.30) (23.2) (-.84) (1.06)

NOTE: Dem is one plus a Freedom House index of democracy and runs from 1 to 101.

The signs of the regression coefficients support our insufficient benevolence hypothesis for all but the wealthiest countries.¹⁶

While the coefficients of the democracy variables in the education equation are not highly significant by usual econometric standards, our general approach does not suggest an extremely tight fit. The approach admits a cost of nondemocratic systems in that since they must rely more heavily on socioeconomic theories rather than decentralized political forces, these authoritarian regimes are more susceptible to decision error. (This effect also shows up in the unusually high variance of the residuals of the less democratic countries, which a casual examination of the residuals clearly indicates. In addition, a standard test for heteroscedasticity reveals a significantly negative correlation between the absolute size of the residuals and the index of democracy.) But regardless of their statistical significance, the regression coefficients appear to be economically significant. For the point estimates reveal that a move from the least to

¹⁶We also tried linear and quadratic variants of the same relationships and found similar results, although slightly lower R^2 's. We also controlled for the degree of socialism in the various countries and found little effect of this additional variable. Our only disturbing result came from trying a much smaller, 36-country sample which had data on the fraction of the country's GNP in agricultural activities. The effects of the agricultural variables systematically swamped all others, indicating a likelihood of significant measurement errors or omitted variables bias in the complete, 91-country sample.

the most democratic existing governmental form in a typical lesser-developed country (one with, say, a \$400 per capita annual income), a move which changes the Dem Index from 1 to 101, is expected to yield about a 12% reduction in expenditures on education and a 130% increase in the amount of child labor.

The interaction terms show that the democratic inefficiencies are absent from the wealthiest countries. To explain this, and also the recent breakdown in our time-series measure of democratic inefficiency, we admit deficit financing into the theoretical argument. Virtually all wealthy democracies have significantly relied on deficit financing over the last couple of decades. This observation of collective transfers away from the young reinforces our earlier inference that there is insufficient collective benevolence to induce collective lump-sum transfers towards the young. Nevertheless, deficit financing itself may somehow allow democratic systems to solve their parental malincentive problem by creating Pareto optimal incentives.

C. Deficit Financing

Suppose now that current adults use the democratic system to obtain lump-sum redistributions from the non-voting youth by means of deficit financing. This they do by floating long-term bonds, having the elderly spend the corresponding tax-cut on their own lifetime consumption, and leaving the subsequent generations with a higher real tax bill to pay for this increased consumption (Thompson [1967]). We consider two cases.

1. The Case of Unrestrained Democracy. Unconstrained deficit financing in a democracy proceeds until the additional collective redistributive gain, the last dollar of transfer to the voting adults, equals their real cost of obtaining the redistribution. This real cost stems partly from

the adults' disutility for the loss in wealth to their children and partly from the political cost of overcoming the future resistance to paying the debt by the upcoming generation or young adult voters, who would naturally reimpose the debt on the then-elderly if the latter did not devote resources to the political process to protect their position.

So now we have two margins and two redistributive-type variables: We have inherited, from the previous subsection, a political allocation in which the adult voters collectively choose to invest too little in their children. (This margin is the collective analogue to (18e) with $G' = 0$ because of social security.) The investment quantity is Pareto insufficient because adults lack sufficient collective benevolence to pay the cost of investments for the young. (I.e., because we observe that $T = 0$, in general $E > 0$ and therefore, comparing (18e) to (8g), there is a general collective undervaluation of A_1^W .) To this investment margin we have, in this subsection, added a margin of lump-sum redistribution away from the young by the use of deficit financing, a margin that includes next-period's real resource drain required for the then-elderly adults to protect themselves against the reimposition of the debt by their grown children. While there is some collective adult benevolence towards the young, there is not enough for the adults to resist the temptation to lump-sum redistribute from the children, despite the resource as well as utilitarian cost of these redistributions. Now the costly redistribution described in the second margin may entirely remove the underinvestment incentive described in the first margin. Under a very plausible assumption, this is exactly what

happens!¹⁷

Suppose the adults slightly expand their underdone investment in education, simultaneously expanding the deficit to finance the investment. If the subsequent distributional equilibrium has the grown-up recipients of the extra investment willing to pay the extra national debt, given the same sequence of political expenditures of the current adults, then those adults will rationally undertake the above investment when the future arrives. The more-educated young adults will -- if they simply pay the debt rather than attempting to force it back onto the now-elderly providers of their extra education -- have slightly more wealth than without the profitable educational investment. And the now-elderly will have exactly the same wealth as they would have had without the investment, given that they make the same expenditures on the political system. Since it did not pay the future young adults to resist the original wealth distribution to the elderly given the latter's political expenditures, it will not pay them to resist it now that they are slightly richer while the elderly are not. As long as the desire for political participation for redistributive benefit does not increase with net relative wealth, a surely perverse thing to assume, the elderly will be able to costlessly collect compensation for, and even slightly profit from, their collective educational investment. Once the returns on such investments fall to where they equal the market interest rate, i.e., once the socially efficient level of investment is reached, the young will

¹⁷The reason is not provided by the theoretically trivial argument that once adults can lump-sum redistribute away from their children, they will always prefer to do this over inefficiently redistributing through underinvestment. In our model, there is a positive cost of the redistribution; the young are not the mere political slaves of adults. Once the young are fully grown, they too will vote. Nevertheless, the efficiency results will turn out, under a plausible assumption, to be the same as if there were a zero cost of redistribution.

again be indifferent to resisting the initial level of redistributive efforts of the elderly because the investments will not increase their relative wealth after they have paid the debt, and the adults will cease making the investments. This establishes our second optimality theorem, viz.: as long as the willingness to politically participate for one's own redistributive benefit is a simple, decreasing function of his relative wealth, unrestrained democratic systems employing deficit financing will Pareto-optimally invest in the human capital of their children.

2. The Case of a Financially Mature Democracy. Let us re-examine the deficit financing margin in an unrestrained democracy, wherein the consumptive benefit of the last dollar redistributed through the extra deficit is equal to the cost to the adult voters. To simplify the argument, let us assume away political transaction costs so that the entire cost of the \$1 redistribution is the result of the adults' loss in collective utility from having the young receive \$1 less in consumptive benefits. If the generations could somehow collectively bargain, the young could not find an offer to make to the adults that would dissuade them from making their last \$1 transfer, even though such a transfer, as we have already noted, creates no substantial net benefit for the adults but represents a net loss to the children equal to \$1. For whatever offer the children make, the same allocation could have been chosen by the adults in the first place. The initial allocation is thus Pareto optimal even though, by any sensible measure, there is an "external diseconomy" of \$1 in the last transfer.¹⁸

¹⁸ Moreover, in any laissez faire equilibrium, such as a solution to equations (15-18), every parent -- no matter how benevolent -- would under-transfer to his children in this theoretically important, albeit non-Paretian, sense. As a result, any individualistic laissez-faire system with each parent giving his children lump-sum transfers (e.g., Barro's world) would achieve a Pareto optimum but not a social welfare maximum. As such

At this point, we introduce some military overseers to the system, people who were implicitly there all the time anyways (Thompson-Faith). Others would introduce a "social welfare function". By doing so, we are introducing institution-creating enforcers into the system, outsiders who have some overall benevolence for all of the people in our economy. These benevolent overseers would obviously lose utility if they thought the last transfer to the adults were going to occur. To them, our unrestrained, deficit-financing democracy is clearly non-optimal. Moreover, these overseers could, if they wished, set up a constrained democratic system to remove this over-redistribution problem. Indeed, the founding military leaders of most evolutionarily successful, but basically stagnant, decentralized agrarian societies regularly imposed a church on their societies, an institution that not only trained and helped care for the young but also inculcated a strong adult belief in the evils of borrowing from future generations and even strictly controlled such borrowing through entail or usury laws, laws giving the church effective monopoly control over the community's borrowing and lending activities. And, upon less church-dominated, Anglo-Saxon systems, military leaders have typically imposed "common law" legal principles that explicitly protect helpless people such as the young. A suitably strong excess of such paternalistic, utilitarian beliefs by political representatives over the beliefs or the voting public solves the over-redistribution problem. The way in which this

parents would privately undo any governmental attempt at redistribution toward their young, this kind of inefficiency is essentially unavoidable, short of complete authoritarianism. Because the number of families with this level of benevolence is relatively small, and the amount of marginal benevolence by all others toward the children in such families is probably empirically insignificant, this potentially very frustrating policy problem is very probably empirically insignificant.

paternalistic, utilitarian moral bias varies over time is also set by the military founders, who determine the system whereby initial legal theories are passed onto succeeding generations of legal thinkers. In particular, giving the system an independent judiciary supported by a politically independent legal educational establishment effectively perpetuates this moral bias. Because political leaders can be expected to receive much more paternalistic moral training than the average voter, if only because legislatures naturally contain a disproportionate number of lawyers (McCormick and Tollison), our legislatures should have a substantially paternalistic bias. Indeed, legislators are regularly observed to express much more relative concern about deficit financing than the average voter. Impressive statistical evidence for the presence of a paternalistic ideological bias by politicians has been recently reported (Kau and Rubin, Kalt).

With a continually moral, utilitarian determination of the deficit we can extend the above-described argument for using deficit financing to achieve a Pareto optimal investment level for children to an argument for using deficit financing to correct all forms of observable democratic exploitation of the young. To see this, say that a slightly excessive amount of child labor initially exists. Current legislators would recognize that the only effect of a bill generating less child labor and a correspondingly higher deficit would be to slightly benefit children. They would not regard the deficit-creating bill as redistributive and would therefore support the bill despite their bias against unconditional deficit financing. They know that future legislators, being morally trained, will select their deficit on the basis of the distribution of utility rather than current wealth and will therefore force the grown children to pay off their

increased debt rather than cutting into the net benefits of the aged; for only in this way can they retain essentially the same distribution of utility that they would have chosen initially. Thus, although legislators will certainly not always expand the deficit whenever the adult voters favor the corresponding redistribution from the young, they will always expand the deficit whenever it is necessary to compensate adults for a sacrifice for the children. The result is a Pareto optimum that does not imply an over-redistribution from the young. A sufficient degree of paternalistic, utilitarian moral bias by legislators in an internally efficient democracy produces a full social optimum. This is our final optimality theorem.

D. An Independent Argument for Deficit Financing:

The traditional popularity in Western democracies of using long-term bonds to finance many local capital expenditures and significant portions of major national wars provides evidence for the existence of our substantial willingness to use deficit financing when the corresponding expenditures substantially benefit the young. However, the predominant legislative tradition of balanced peacetime national budgets despite the growing national participations in peacetime educational investment, at least until the past couple of decades, indicates the predominance of an overly conservative, financially immature, fiscal rule-of-thumb, one generating the collective parental malincentive that generally showed up in our regressions and will show-up again in our historical study in Section V.

The possibility of a full social optimum achieved by financial maturity has come about by a change in legislative morality away from the old Calvinist principle of a balanced peacetime budget and toward a more flexible morality in which legislators are now willing to vote for peacetime deficits, but only if the real political gains outweigh the moral cost of using the

deficit to redistribute away from the children. But perhaps this policy has gone too far. In view of the substantial recent increase in national debt relative to cumulative national investment in children, we require an independent welfare argument for the peacetime reliance on deficit financing.

Consider a sequence of certain, equi-present-value legislative redistributions from young to old in an economy certain to grow more slowly than its real interest rate. With each redistribution involving a political resource cost and the whole process yielding only net redistributions away from groups whose present wealths are lower than the voting adults, the scheme would hardly attract a military founder. An independent policy of deficit financing would be difficult to support on welfare grounds. But the above physical environment is not technologically realistic in anything but technologically stagnant societies, where moral scriptures against peacetime deficit financing indeed took root.

To move away from this technology, first suppose that people reasonably expect that the real interest rate at all dates beyond some date in the distant future may always fall below the corresponding aggregate real growth rate so that society might never have to pay for the initial redistribution to the current elderly. In this case the future real resource drains may easily be justified by the current benefit. This infinite-horizon type of market-inefficiency, however, requires us to assume that private pension funds are somehow unable to exploit the same profit opportunity as easily as the government (Thompson, [1967]). Furthermore, empirically speaking, private funds in the form of unfunded union pension funds came in over a century before peacetime deficit financing began to appear.

We are left with the possibility that the sequence of redistributions is itself uncertain because the entire society is expected to end in a

surprise collective disaster. The introduction of such an expectation significantly lowers the expected return to childrearing and thereby reduces the rational rate of population growth. We saw such an effect in the West right after we lost our nuclear monopoly in the early 1950's. The reduced rate of population growth increasingly raises the wealth of the young, if they survive, and, correspondingly, increasingly raises the return to middle-income voters to employing deficit financing, which will only burden the young if they survive, in which case they will be relatively very wealthy and should be redistributed from. This is a plausible reason for the gradually increasing deficit since the early 1960's. With Keynesian theology having worked to coincidentally soften-up the traditional Calvinist heritage, financial maturity was a natural consequence of the new technology. We have thus found a behavioral rationalization for the recently observed redistributions from the young and, at the same time, provided an independent welfare rationalization for benevolent overseers to prefer a modern, financially mature democracy over an old-time, financially immature democracy, one with unconditional legal or moral restraints against all peacetime deficit financing.

V. PARENTAL MALINCENTIVES AND GOVERNMENT PRODUCTION

The above analysis concludes that significant parental malincentives occur only in poor democracies, where collective as well as private benevolence is relatively weak and the state's poverty is likely to bring with it an observable lack of peacetime deficit financing. A straightforward test of this proposition is provided by applying it to governmental production decisions. If poor democratic governments do indeed have parental malincentives, then governmental production decisions should

reflect these malincentives. A switch to democracy by a poor country should therefore change the character of government production to a form that inefficiently exploits the non-voting, younger generation. Military effort is, by far, the historically most important governmental production activity. Therefore, a switch to democracy by a poor country should lead to a substantial increase in the military training of the country's youth and an artificially lower cost of aggressive warfare. The poor country's switch to democracy should thus immediately increase the severity of its military training and subsequently increase its military aggressiveness.

To see if this is the case, we need only review a series of common, if not predominant, observations in the history of Western civilization, where democracy has been a frequently observed social institution.

The first constitutional democracy in recorded history appeared in a desperately poor, beleaguered Dorian town early in the 8th Century B.C. called Sparta. What immediately came out of the Lycurgian legislature, one comprised of all free men at least 30 years of age was, of course, probably the harshest system of military training ever devised. Within fifty years, Sparta became dominant over all of the rich lands of her Laconian neighbors and, within two centuries, grew to complete control the entire Pelopennese. Tiny Megara by her Northern border repeated the feat less than a hundred years later. By her Eastern border, a democratic constitution was finally established for Athens in 508 B.C., whence she began her meteoric rise, going from insignificant Spartan plaything to hegemonic and cultural leader of most of continental Greece and the Aegean islands in just fifty years.

The first constitutional democratic federation was the League of Corinth, established in 338 B.C. by Phillip II of Macedonia, the new, aggressive, democratic entrant to Greek hegemonic competition. The semi-

barbaric, militaristic nature of these Northern Greeks made it advantageous for them to formally -- i.e., constitutionally -- restrict the powers of their federation's leader, the Macedonian king, in order to convince potential joiners of their generous intentions (mainly to free the area of the persistent Persians). As the League's constitution required the numerous Aegean tyrannies and aristocracies to adopt common, democratic, voting institutions without internally redistributing from the existing creditors and property owners, we should expect the elected representatives to support new wars of aggression, not only because of the substantial, now-expandable size of the effective governmental unit, but also because of the substantial decrease in the wealth of the average voter. Alexander's convincing election to the position of supreme commander of the Hellenic confederacy after Phillip's death and his universalistic interpretation of the League's democratic constitution (Tarn, Heisserer) provided the new expandable form of democratic government with a confident and sensitive leader. In the space of a dozen years, the fledgling democratic League conquered all of the economically important areas of the ancient world. The less universalistic successors of Alexander -- just as the less universalistic successors of the Zoroastrian Cyrus of Persia in the 6th Century and of the Grecophilic Pericles of Athens in the 5th Century before him -- then allowed their correspondingly less democratic confederations to deteriorate under the pressure of poorer, more democratic, foreign aggressors. The last such aggressor in antiquity was, of course, centered in Rome.

The year 338 B.C. saw Sparta's Western relative, Rome, as well as Macedonia, adopt a constitutional policy of generously integrating conquered neighbors into the Republic. Rome's policy was to offer its victims "Latin Rights," the full legal rights of Roman citizens. But unlike Macedonia,

Rome retained its aristocratic internal rule and thus largely remained just another embattled city-state until, exhausted and facing a complete Plebian military mutiny in 287 B.C., the aristocracy caved in and gave the poor Plebs complete legislative control in the form of the Lex Hortensia. Soon after this radically new democratic constitution was thus added to her generous policy of confederation, we begin to find the large, fanatically-disciplined legions for which early Rome became famous. Correspondingly, within the 100 some-odd years that passed before for the aristocratic Senate reasserted her domination, the struggling little city-state produced an unparalleled string of military victories that gave her effective imperial control over the entire civilization of the Northern and Central Mediterranean. Aggressive expansion slowed under the subsequent oligarchic Republic and stopped entirely under monarchial Empire.

Both the Germanic confederations in the North and the later Mohammedan confederation in the South, the primary respondents to the temptation of Roman wealth and peacefulness, were themselves newly formed democratic confederations of poor tribes recently trained to extremes of "barbaric" or "holy" military self-sacrifice. Once success was achieved, the surviving, amply rewarded, families of the warriors became lords over large areas. Consequently their annual tribal assemblies became much less practical, and, internally, there was little reason to offer dangerous democratic rights to their captives, who could probably be better managed by priests informed about the habits and language of the local population. As a result, the initial, democratic institutions tended to rapidly disappear. Dark-age democracy in the area of the old Roman Empire was thus only a temporary institution for organizing marauding tribal confederations. (This self-sacrificial democracy was seen first among the early Goths and Vandals

(Chapman), then among the Franks of both Clovis and Charlemagne (Kitchin), and finally among the Vikings.) In the North of Europe, where Roman civilization had much less influence, there was no such call to abandon tribal confederations and replace traditional local democracies with local authoritarian bureaucracies. The more gradually expanding Germanic tribes aggressing in the North therefore largely maintained their democratic political heritage. This occurred most notably among the Angles, Saxons, Jutes, Danes, Frieslanders and Normans and was probably responsible for the early dramatic colonial expansions of the relatively democratic Dutch, Scandinavians, and English once the invention of gunpowder dramatically increased the optimal size of the state and the return to long-distance conquest. Among these, England started to become by far the most democratic in the 17th century, whereupon began her great ascendancy as a colonial power, which ceased only sometime after she became the first urban-egalitarian-type democracy early in the 1830's.

Spain, like the relatively democratic countries of Northwestern Europe that were excellently prepared to exploited the colonization opportunity during the formation of Nation States in the 15th and 16th centuries, was similarly prepared because she had to maintain much of her highly aggressive, democratic, Frankish and Visigothic roots throughout the Middle Ages in order to eventually expel the Moors. But these feudal democratic forces were soon rapidly overcome by the strongly authoritarian Roman Catholic influence, working through the growing internal power of her kings, in the early 16th century, whereafter her glorious empire was pitifully emasculated. (Sweden, having less of an initial democratic impulse and less of a colonizing expansion than Spain, suffered analogous, but less severe, colonial losses on her 17th century turn to absolutism.)

The economic success of these aggressive Northwestern democracies was, of course, not ignored in the late 18th and 19th centuries by neighboring European countries. The ensuing adoption of popular democracy came first to an impoverished France, who quickly introduced the world to peacetime military conscription. Her consequently massive, "enlightened" troops soon thereafter began their unforgettable march on all of Europe. While this initial democracy, and soon thereafter the Empire of Napoleon, collapsed, a more durable, constitutional democracy was formed on the heels of Napoleon III's ignominious loss of Alsace Lorraine to Prussia in 1870. French soldiers then fought their country's way from a just another shakey continental state to a world colonial power second only to England in the few remaining decades before W.W.I.

Popular democracy came to America in the 1830's by the introduction of Jacksonian Democracy and the extension of voting rights to the lower-middle and middle classes. We immediately began to fashion a fiercer breed of soldier and found our "manifest destiny"; thus beginning our acquisitive Westward march to the Pacific. After that, we continued by acquiring extra-continental colonies until our prosperity, like the prosperity of other colonial democratic powers, sufficiently reduced our military aggressiveness.

Democracy came to Central Europe in the late 1800's and early 1900's. The result was our two World Wars. Given all of the historical experience that preceded it, the Second World War should have come as no surprise. When we gave an impoverished Germany both democracy and military independence, we gave her a tremendous incentive to exploit her youth by fanatical military training. The complementary election of a Hitler should not be considered some historical fluke. As for Japan, she had an entirely insular, isolationist military before we imposed quasi-modern, democratic

institutions on her in the late 1800's. After a short lag, she began to aggressively expand all over the Far East and was a predictable ally for the other main aggressor in WWII.

The natural extension of the theory to the post-WWII period, wherein the only half-way serious wars by historical standards involved the suddenly emerging democracies of the East, is to point out that the developing financial maturity of the West has dramatically cut the severity of our military training and correspondingly eliminated the traditional military aggressiveness of our Western democracies.

What seems to have thrown-off most historians and social thinkers is that once a financially immature democracy determines an expansive, war-requiring, territorial objective, its best policy is to elect a determined, aggressive leader and give him temporary authoritarian command in order to best establish a firm commitment for the country to continue to fight to the death in order to achieve the objective (Thompson, [1974, 1979]).

A large, independent, democratic state without access to internally redistributive deficit financing located next to some relatively wealthy countries is thus very likely to impose some sort of fanatical military training on its youth, elect a militant leader, and then attack the wealthy neighbors. The lessons to any wealthy democratic country are clear:

(1) Do not encourage large, poor neighbors to become democratic, (2) Only encourage large poor, countries in distant locales to become democratic if you want to make life tough for their neighbors.

There were plausibly independent, poor democracies with relatively wealthy neighbors that did not become aggressors in Western history, all the way from numerous non-Dorian Greek city-states to strongly Roman Catholic democratic experiments in the modern era. What distinguishes the poor

democracies from those in our historical review is that the latter also had an efficiency ethic called "civil reverence" (Thompson 1987). However, rather than returning to our review to appropriately qualify the above, "poor-democracies-become-military-aggressors" hypothesis by explicitly introducing a civil reverence condition, we can make essentially the same point about parental malincentives in poor democracies by pointing out that the above survey gives unqualified empirical support for the converse hypothesis, namely that the great historic waves of Western military aggression were all begun by states that had recently become poor democracies.

To further test the theory using the same cross-sectional methods that we used in the previous section, we regressed military employment over military expenditures in the 56 countries for which we could find data against their per capita income, democracy, and an interaction between democracy and per capita income. The results were as follows

$$\text{LN } \frac{\text{Milit Employ.}}{\text{Milit Expend.}} = 3.9 - 7.5 \text{ LN } \frac{\text{GNP}}{\text{POP}} + 0.4 \text{ LN Dem.} - 2 \times 10^{-5} \frac{\text{GNP}}{\text{POP}} \text{ Dem.}$$

(8.7) (2.6) (1.7)

(See Appendix C for data sources.) The results again indicate that while poor democracies generate significantly positive measures of collective exploitation of the young, wealthy democracies do not. Again, our explanation for the elimination of the democratic exploitation effect in wealthy democracies is their adoption of deficit financing¹⁹.

¹⁹It is as if the government had carried out an old policy prescription of Tollison, which recommended imposing a financial debt rather than a military service obligation on our young male adults.

VI. SUMMARY

An elaboration of Marshall's parental malincentive argument provides a detailed economic rationalization of the commonly observed qualitative pattern of social legislation around the world. Our model of political decision-making explaining the observed pattern of social legislation requires extra-familial benevolence and is thus related to previous studies of Marglin and Sen on the effects of public-good benevolence on the efficiency of private investment within a democracy. Their private "under-saving" resulting from public-good benevolence toward future generations by existing voters simply represents a laissez faire underprovision of real benefits for children and appears to have been sensitively responded to by traditional, voter-efficient, democracies.

Nevertheless, our theoretical and empirical analysis also shows that public-good benevolence has been too weak for such democracies to provide Pareto-sufficient levels of collective investment for their youth. This confirms Pigou's classic conjecture on the inefficiency of simple democracy.

A realistically benevolent, voter-efficient democracy can, however, eliminate Pigou's nonoptimality if the democracy also adopts a policy of collective lump-sum redistribution from the young. Such a policy, in the form of peacetime deficit financing, has recently evolved in various wealthy democracies and indeed appears to have eliminated the Pareto nonoptimalities of Marshall and Pigou. Nevertheless, for a full social optimum rather than simply a Pareto optimum, political representatives in deficit-financing democracies must retain a paternalistic bias toward protecting future generations so that they choose a lower deficit than is in the interest of the voting public. Such a bias has been uncovered in the recent studies of both Kau-Rubin and Kalt.

APPENDIX A

This appendix describes the sources for our test using U.S. time series data for the years 1890, 1913, and the even-numbered years in the period 1930-76.

Since we could not find a single time series for current (i.e., noncapital expenditures on public and private elementary and secondary education), we began by constructing a series on total elementary and secondary school expenditures, first for the period 1930-76. The Digest of Education Statistics, 1977-78 provided an even-numbered years series on total educational expenditures for 1930-76 (p. 23). From this series we subtracted the corresponding biennial estimates of current expenditures for higher education (Historical Statistics of the U.S., Colonial Times to 1970, p. 382 [for 1930-70]; Digest....1977-78, pp. 134-35 [for 1972-76]) and the biennial estimates of capital expenditures for higher education (Historical Statistics.... p. 385 [for 1930-66]; Digest.... 1977-78, p. 23 [for 1970, '76]; and Digest of Education Statistics, 1976, p. 25 [for 1972, '74]). To estimate total elementary and secondary school expenditures for 1890 and 1913, we multiplied those years' total public elementary and secondary school expenditures (Historical Statistics...., p. 374) times the respective years' ratios of the number of students enrolled in all elementary and secondary schools to the number enrolled in public schools (Historical Statistics...., pp. 368-69, 384). Then the resulting 1890-1976 values for total elementary and secondary education expenditures were each multiplied by the yearly ratios of current to total expenditures on public elementary and secondary schools (Historical Statistics...., pp. 373-74 [for 1890-1974]; Digest...., 1977-78, p. 71 [for 1972-76]). The products are the time series

of current expenditures on elementary and secondary education.

We encountered similar problems in obtaining a series measuring public and private charitable transfer payments. For the public component we used federal, state and local government expenditures classified as "Public Aid," "Health and Medical Programs," "Housing," and "Other Social Welfare Programs" (Historical Statistics..., pp. 340-41 [for 1890, 1913, 1930-70]; Statistical Abstract of the U.S., 1977, p. 317 [for 1972-76]). Our series private charity component included philanthropic donations for 1913 and for the even-numbered years from 1930 to 1976 (The World Almanac and Encyclopedia 1914, p. 616 [for 1913]; Historical Statistics..., p. 359 [for 1930-76]; and Giving, U.S.A., 1976 Annual Report, p. 6 [for 1976]). Unable to find data for 1890 private philanthropy, we estimated that number of multiplying the 1913 ratio of private philanthropy to public welfare measures times the 1890 figure for public welfare expenditures. This estimate of private charity for 1980, along with the private charity figures for 1913 and the period 1930-76 were added to the relevant years' public welfare payments to obtain the series used in the regressions.

The nonhuman capital investment ("Gross Private Domestic Investment") and GNP data came from National Income and Products Accounts, 1929-1974 (pp. 2, 3, 344 [for 1930-72]), Survey of Current Business (July 1977, p. 18 [for 1974, '76]), and approximations based on information in Historical Statistics... (p. 231 [for 1890, 1913]).

APPENDIX B

This appendix describes the data resources used in our international cross section test. The source of the child labor statistics was the Yearbook of Labor Statistics, 1977, e.g., the source of the per capita educational expenditures data was the UNESCO Statistical Yearbook, 1977, pp. 535-554. The source of the population and GNP data was the Stockholm International Peace Research Institute Yearbook, 1974, pp. 205-229. Finally, the source of the Democracy Index (and the Socialism Index mentioned in footnote 14) was the Freedom House's Comparative Survey of Freedom, 1978.

APPENDIX C

For data on armed forces relative to military expenditures, the U.S. Arms Control and Disarmament Agency's World Military Expenditure and Arms Transfer, 1985 (pp. 52-88). Our democracy index was from Raymond Gastil's "Comparative Survey of Freedom," in Freedom at Issue, no. 54, Jan.-Feb., 1980 (pp. 4-5). We obtained our income per capita data from Laband's, "Is There a Relationship Between Economic Conditions and Political Structure?" Public Choice, Spring, 1984, pp 26-31.

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