



The Risks of Growth

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Source: *Daedalus*, Vol. 102, No. 4, The No-Growth Society (Fall, 1973), pp. 103-118

Published by: The MIT Press on behalf of American Academy of Arts & Sciences

Stable URL: <https://www.jstor.org/stable/20024169>

Accessed: 27-05-2020 22:04 UTC

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The Risks of Growth

ECONOMIC GROWTH, until recently a goal which illicit near universal agreement, now gets a bad press.¹ This decline in reputation was to be expected. Little new has been added to the progrowth argument, while the anti forces have presented much new evidence. Advocates of growth retardation or arrest have surveyed the societal ills that have accompanied our recent years of growth, then extrapolated, perhaps a bit too quickly, from correlation to causality, and attributed them to the processes of growth. Furthermore, these advocates tell us, history reveals but a fraction of the dangers; they have peered into the future, and discerned that matters will become bleak indeed if we continue in the ways of growth.

In this essay I am cast as the defender of the out-of-fashion view that growth is not pernicious but desirable. I shall make arguments in three areas. (1) Ground Rules: Many objections to economic growth would vanish if appropriate terminologies were defined and ground rules established. (2) Predictions: There is no convincing evidence that slowing growth would create a rosier present or future. (3) Distribution of Welfare: An antigrowth policy would help some groups and hurt others, and there is no compelling argument that the groups it would help are more deserving than those it would harm. I conclude with a discussion of the risks of economic growth, and some significant qualifications regarding the restricted scope of my analysis.

Ground Rules

What we are discussing is growth of the total economic product. Appropriately defined, this is the total value to the individuals in a society of all the goods and services they consume, including not only the commodities traded on the market, but also those like congestion, health, leisure, and pollution which are not. Since nothing that people value economically is left out of this total economic product, we might label its growth "economic improvement."² Growth in GNP would not merit that label, for that measure

has two shortcomings. First, it explicitly leaves out valued goods and services that are not traded on the market. Second, it includes intermediate market-traded goods, like defense and commutation expenditures, that are merely inputs to the production process rather than final contributors to economic welfare.

Recently, William Nordhaus and James Tobin have defined a statistic called the Measure of Economic Welfare (MEW)³ that avoids these failings. Unfortunately, we have no experience with MEW statistics, and it is evident that, given our present lack of sophistication, many arbitrary decisions will be needed to compute them. The choice between MEW and GNP as guides to policy is a choice between an appropriate but insufficiently understood indicator and a biased but familiar and relatively unambiguous one. If we had equal facility with the two, we would all opt for MEW. What are the potential dangers if we rely instead on the expedient GNP? Unfortunately, GNP and MEW do not rise and fall in perfect harmony.⁴ In fact, one argument for slowing growth is that gains in GNP have become so expensive in terms of omitted or double-counted factors that they actually shrink MEW.⁵ Thus, employing GNP as our guide could lead us astray.

What is to be done? The ideal solution, in concept at least, is to provide incentives so that MEW is automatically maximized. This could be accomplished if we could clock all valued variables, not just the subset that is counted at present, through the turnstyle of the market.⁶ Presently excluded variables would in this way gain admission to economic activity statistics. More important, decision makers, acting in their own self-interest, would be led to take account of the true social costs of such variables.

Some first steps toward providing appropriate incentives are obvious. It is surely right to establish congestion and effluent charges to discourage the present charge-free fouling of common property. A greater stride would be to eliminate misguided public expenditures by assessing taxes on a benefits-received basis. Then taking a giant step, we could develop an arrangement for taxing leisure at the same dollar rate as work time. This, in effect, would impose a system of lump-sum taxation on individuals; no longer would one's work-leisure choices be influenced by the fact that income is subject to a discriminatory government levy. Myriad economists with years at their disposal might be able to implement these ideas. For the time being, we must recognize that it is more difficult to restructure incentives to achieve efficient outcomes than to recognize that such restructuring would be desirable, could it be accomplished.

I suggest that agreement on the following points would establish some ground rules for growth-rate discussions: A measure like MEW, such that its growth represents a true improvement, is the appropriate index of economic welfare. It is difficult, however, to compute an MEW index and well nigh impossible to assure its automatic maximization. Finally, the GNP, although its use is expedient, is a possible source of error.

Predictions

Accurate predictions are the foundation of robust policy judgments. A reasoned evaluation of the antigrowth argument requires that we determine the consequences of a policy of growth retardation. In a decentralized, predominately capitalistic society like our own, the growth rate is hardly a variable subject to control by central decision-makers. Rather, it is determined by a confluence of decisions by millions of citizens. Policy-makers can take a limited range of actions, and they can alter the incentives for action by others. Still, it would take an extraordinary piece of social engineering for them to create a no-growth society. Perhaps those antigrowth advocates who propose that the government take direct action to slow the growth rate have been encouraged by the paradigm of neoclassical economics, which despite its long-standing attachment to little people making little decisions, has produced Big Brother growth models. In these models, a central decision-maker, using the investment rate as a throttle, can ease us onto a Golden Age track. In this world of graphs and equations, if the growth pace is too swift, a few adjustments in aggregate policy variables can put us on a slower course.

In the recent past, however, when growth was a sacred objective, we discovered that the government could actually do very little (at least with present knowledge of economic dynamics) to accelerate it. Boosts that were achieved, say with investment credits, in no way altered the basic structure of economic relations. The major effects they did achieve may simply have been transfusing growth from future booms back to present slumps. This implies that slowing growth by policy measures that were mere reversals of previous boosting efforts would be equally difficult. Effective long-run retardation would require experimentation with unaccustomed devices and procedures. In order to achieve the basic goal of less output, either the input levels would have to be contracted, or the level of output for any given inputs would have to be reduced. The government would probably have little difficulty contracting the inputs by triggering periodic depressions; big boosts in taxes without accompanying government expenditures would do the trick. More in the microeconomic area, it could pass edicts reducing the work week, or discouraging or prohibiting overtime.⁷ As an alternative, it might try to reduce the rate of capital accumulation by creating a more consumption-oriented society, perhaps through subsidies for consumption or heavy taxes on savings. Within our present economic structure, except for extreme measures such as government-sanctioned sabotage, there seems to be little we could do to reduce the level of output for any given inputs. If we merely wish to shrink the potential level of future output, however, we might achieve some success by slowing down technological progress. We could, for example, curtail government funding for research and development and squash science and engineering in the universities;

more indirectly, we could give corporate research and development expenditures a new special status so that they would no longer be tax deductible.

These policies may look ridiculous, in part because they are, but also because they are unfamiliar. Their effects are hard to predict.⁸ These policies might turn out to be more powerful than we expected, or they just might knock the economy out of kilter, producing an entirely inappropriate mix of goods and services. (When confronted with the antigrowth philosophy, even economists who normally cold shoulder the invisible hand are likely to experience stirrings of fondness for market-guided outcomes.)

What, then, can be the argument of those who favor slowing growth? First, they consider economic growth and MEW to be, in aggregate, negatively correlated. This proposition alone, however, does not lead to the conclusion that growth itself should be retarded, for it would be far preferable merely to discourage those components of economic growth that contribute negatively to MEW. Such people must also subscribe to the proposition that more refined procedures are too weak and that the best way to boost MEW is through a blunt curtailment of GNP growth. To establish these two propositions, however, an impressive body of evidence, or a series of logical arguments will have to be marshalled. Empirical data that have been gathered to date do not support the antigrowthites' view,⁹ since decline is not yet upon us, but rather, they predict, just around the corner. These advocates of growth retardation would have us rely on the gloomy predictions of their analytic and computer models.

Let me turn to their darkest prophecy, that regarding exhaustible resources. They observe that exponential growth, always a formidable enemy, has loosed its terrors on resource consumption. The perceived dangers are enormous. If economic growth continues its exponential course, we will soon outstrip our energy capacity and exhaust our resource supplies. The popularity of this prophecy is frightening not because of its predictions of doom, but because of what it says about its supporters' willingness to abandon analytic thinking processes. Consider a simple parable. A land is blessed with substantial reserves of readily accessible (zero extraction and refining cost) underground oil. When its oil runs out, it will have to turn to an expensive nuclear process for its energy needs. How should this society view its oil? It is a one-time only gift, much like a one-time only shower of manna on a community that otherwise must labor to produce its food. Clearly, that society should use up its manna, just as ours should use up its oil.

Continuing with the parable, let us analyze how the market would function. Once the oil is gone, let us say that it will take five man days of productivity (the amount F), to supply an individual with a year's worth of energy. If oil is going to run out this year, no well owner will sell a year's worth of oil for less than F , and no buyer will pay more. But if the well owner can sell oil a year before exhaustion, he can invest his receipts in something else

and earn the interest rate r . Thus he need receive only $F/(1 + r)$ for his oil in the penultimate year to be indifferent as to whether he sells then or a year later. Following this induction process backwards, we see that, in a perfectly functioning economy, the equilibrium price of oil or any other exhaustible resource should rise at the rate of interest, which is, of course, the rate of return on investment.

In real life there will be deviations from this projected optimal pattern.¹⁰ Indeed, rough observation indicates that the rate of increase in the price of depletable resources has been below the rate of return on investment. If we really believe in policy intervention to correct the misperformance of markets for natural resources, then this observation would suggest a proposal that seems particularly heretical against the background of contemporary discussion. To depress present prices relative to future ones, we should supply greater amounts of exhaustible resources to current markets, thereby boosting their consumption rates.

What of a resource for which there is no substitute, say a metal whose properties cannot be reproduced? Recycling is a useful palliative measure.¹¹ The cost of recycling sets the ceiling price; thus it plays a role equivalent to the nuclear generating cost in the energy parable. If recycling is ruled out because it is unproductive or extremely costly, the efficient pattern of use would, at some future point, exhaust the total stock of a good (unless there remains finite demand for the good at almost infinite prices). Then we might have to build thicker bridges or slower planes, but the world would not come to an end.

In their great devotion to natural resources, antigrowthmen have been relatively neglectful of the other factors of production: capital, labor and land. But growth can be achieved by increasing the inputs of these factors as well. How should we feel about using more of them in our productive processes? Our primary interest in capital derives from its interaction with people, an interaction which may be significant: witness the Lordstown linemen, the IBM executives, or the victims of auto accidents. But, for the most part, machines and buildings are machines and buildings, and we don't care how many of them are in existence.

Labor plays an interesting dual role. Population growth brings us increased labor input, but creates more claimants on the production process as well. Do more people each getting less (in terms of space as well as output) represent an improvement? This sounds like a theological question. It can be ducked for now, since our subject is economic growth, and we do not yet understand how economic growth influences population growth. If we did know, and if the relationship turned out to be strong, this might well dominate our thinking about economic growth.¹²

Land is the one factor of production that causes problems for the advocates of growth. Land has special structural properties. Short of filling the oceans, humans cannot manipulate the total stock of land, although they

can affect its quality. More important for the present discussion, that stock has a utility independent of its productivity; the members of society, quite simply, care what landowners do with their asset. Given this externality, market forces alone will not provide an adequate guide to its optimal use. Economic growth, it would seem, could prove pernicious here in that it shifts the incentives for land use, probably to the detriment of the bulk of our citizens who enjoy scenic beauty and open space more than parking lots and shopping malls. Could this provide an argument for slowing growth? I don't think so. Measures like zoning, or taxes and subsidies on land use can go a long way toward assuring appropriate land use without creating as many harmful side effects as would slowing the growth process itself.

Economic Growth and the Distribution of Welfare

The analysis thus far has been directed to the aggregate effects of growth. In a society that adheres to traditional liberal values, however, the appropriate way to evaluate growth policies, or any policies, is to examine their effects on the welfare of different individuals. Usually the choice of one policy over another benefits one individual or group more than another. Modern welfare economics, however, has provided us with the clear negative conclusion that we have no satisfactory procedure for weighing the interests of different individuals in order to arrive at an aggregate measure of welfare in our society: Benthamite utility calculations cannot be implemented. We could throw our hands up in despair or retreat to mysticism. But it seems more reasonable to list the consequences of different policies and to seek *ad hoc* procedures for evaluating the resulting lists.

It seems unequivocal that an individual's welfare is not solely determined by the bundle of goods and services he consumes. What matters very much, in addition, is his position vis-à-vis the others in his society with whom he can compare his condition. Considered in this light, for example, the typical American ghetto dweller is worse off than a wealthy African tribesman, despite the fact that he may have more of the vast majority of material goods. In order to compute the effects of economic growth on individual welfare, we certainly want to know how each individual is faring relative to his near and not-so-near neighbors. We would also like a comparison of his present status with the way things used to be. The fact that economic matters are getting better and better may make up for a relatively low position on the income totem pole; on the other hand, it may boost dissatisfaction by increasing expectations. (I would be uncomfortable trying to document my speculation that the first force predominates.)

When growth and distribution are discussed together, the usual concern is the welfare of different generations. From the standpoint of equity as well as the political exigencies of decision making, it seems equally important to identify the welfare of different income classes both at present and in the

future. Consider the distributional implications of the stationary state, a limiting case of no growth. Assuming it could be achieved, it would allow very little room for departure from one's present position in the income distribution. And one's sons and daughters probably wouldn't be able to stray very far either. The distributional effects of growth, on the other hand, are more difficult to predict. But we can say with some confidence that the types of societal changes that would come with growth would mix things up a bit. New skills and talents would become desirable; old ones would go out of style. Furthermore, the patronage-nepotism-old-boy system might lose some of its power when the old boys found their share of the market substantially diminished. Growth produces many gainers and, at least if relative position is important, many losers as well. The choice between growth and no growth may depend on whether our concern is greater for the present or for the future poor, with the present poor being the natural advocates of growth. Let us examine, in turn, what retarding economic growth would do for the present poor and for future generations.

The ecology and antigrowth movements have many common objectives. This suggests that their members and major beneficiaries might come from the same classes. If, as is often alleged, the ecology movement has a middle and upper-class orientation, can the same bias be detected in its antigrowth offspring? Is the antigrowth movement founded on values that are particularly appealing to the upper strata of society? Are the areas of improvement it seeks those that our more privileged citizens are likely to value highly? Does it drain government funds from projects that would benefit the poor relatively more?

A look at the goals of the movement provides the answers. Antigrowth promotes stability, insulation from rapid technological change, and acceptance of *status quo* living conditions. The most significant improvements it offers are in the physical environment. It would also protect us from certain societal disasters that would affect all members of society. If the movement were successful, however, it would eliminate the automatic revenue growth that is reaped by the federal government. New social legislation would be harder to secure, for it would have to out-wrestle old programs for funds.

A no-growth society would work most severely against the interests of the poorer members of society. To improve their position, they would have to scrap over the fixed pile of societal resources; any absolute gain they achieved would be somebody else's absolute loss. If zero economic growth were imposed on the current structure of the American economy, Lester Thurow has calculated, "the distribution of family income would gradually grow more unequal, blacks would fall farther behind whites, and the share going to female earnings would fall below what it would otherwise be."¹³ Not only would the poor lose the constant moving and shaking created by

the natural economic processes of a growth-oriented society, but the political values of the more privileged classes would be likely to take a more conservative, perhaps even an oppressive turn. Traditionally, the increasing affluence of the lower strata of society has worked to the benefit of society as a whole, but in a no-growth society, any promotion of economic opportunities for the poor would work directly against the interests of the affluent.

Just as growth or no growth affects politics, so politics can affect the type of growth we are likely to see. I argued above that we should evaluate the results of growth policies in terms of their effects on individuals. Growth is a people mixer. Though it may increase average welfare, it will also hurt some people. If the potential losers can foresee this, and if they can inhibit growth, then they will do so. Consider the advent of the automobile and the millions of jobs it created. Surely the makers of buggy whips would not have welcomed this development; indeed they may have tried to stop it. At the very least their plight must have been covered in the newspapers. But who could have been photographed to represent the future automobile workers who would surely benefit from this innovation? It might have been confidently predicted that there would be thousands of them, but they were not identifiable at that time. Therefore, they could exert no political influence to counterbalance the pressures of the opponents of change.

But could not some individuals discern that they were among the ranks of potential gainers, that although nothing was certain, on the average they would benefit from the introduction of the automobile? Surely the answer is yes. But no specific individual's expected gain would be likely to equal the expected loss of any of a number of already identifiable individuals. A first dictum of pluralism is that small groups with heavy interests count more than large dispersed groups with small interests, even when the total interests of the latter are greater. Therefore the losers often exert a disproportionate influence in the political struggle.

Where technological change is concerned, we would expect losers to be identified while gainers were not, a situation, I would argue, which tends to inhibit the types of technological change that would, on the whole, promote growth. Taken alone, this implies that we would be likely to have too little growth. Better seers than I would be needed to make confident predictions about the long-run distributional effects of this phenomenon. I would speculate though, that to succeed in preventing change, the identified potential losers would have to have significant power. Thus they would be unlikely to be among the underprivileged groups in the present society.

Future generations are most fortunate, at least from the standpoint of political argument. Their self-proclaimed supporters include both proponents and opponents of growth. The proponents argue that our only legacy to the future is the value of the capital stock we convey to them. Since, as Einstein has demonstrated to the skeptics, goods cannot be passed backwards

through time, there is no way that future citizens can pay us. An increase in the capital stock we leave the people of the future must unambiguously increase their welfare.

Some spiritually motivated members of the antigrowth lobby might reject even the principles of this argument. They could argue that bequeathing more capital stock and hence more material goods income to the people of the future might prove downright detrimental because of its tendency to undermine social values. Something that we expected to be good might prove to be bad, because other things are particularly unequal.

Even those antigrowthites who concentrate on economics rather than values need not consider a bountiful capital stock a boon. The difficulty they perceive relates to measurement. An increase in capital stock, as conventionally measured, may be accompanied by increases in environmental degradation and decreases in the levels of unexploited resources—undesirable movements which are not included in the definition of capital stock. The long-run picture the antigrowth forces perceive is particularly dreary. They confront us with a choice of suicides: drown in our refuse or perish when our resources run out. I take a less alarmist view. The resources that are privately owned, as I have discussed above, provide no problem whatsoever. And we are improving our capabilities to place efficient rationing devices on the consumption of such commonly owned resources as ocean fish and environmental purity. Exacting prophecy is required to determine whether at some future time, growth in capital stock will or will not prove detrimental.

However, even in those areas where the problem is not one of prediction, we face extraordinarily difficult questions of a different sort. There can be no disagreement that other things being equal, our future citizens will be better off the cleaner the world into which they are born. Furthermore, we of the present can make sacrifices to preserve or at least to slow down the degradation of the environment. Even assuming that we had a universally accepted welfare meter and that we knew what made it go up and down, what should we sacrifice for our future brethren? In the liberal spirit, we are always interested in making transfers. But if historical trends can be extrapolated, our descendants will exceed us in material wealth. And even those members of the antigrowth lobby who would dispute this contention would not, I think, try to justify environmental preservation as a measure to improve the dynamic income distribution between us and our descendants.

Transfers to the future must be justified on grounds of efficiency; they should be made when, at a very small sacrifice to ourselves—a poorer generation—we can provide a big gain to the wealthier generations of the future.¹⁴ We shouldn't dump garbage in the Grand Canyon, even though the money savings to our generation would more than offset our personal recreational loss. The losses to future citizens, after all, would be enormous.

The decision here is easy, but it gets harder as the ratio of our savings to future loss narrows. Just what tradeoff rate in welfare should we require before we help the future at the expense of ourselves? How should we even address the question?¹⁵ It's hard to know, but on the operational front two things seem clear: one to one is too low a ratio and, given a choice, present society as a whole would be less generous with its welfare than its anti-growth spokesmen would have it be.

One way to get our thinking straight about transfers that we should like to make to the future is to construct an equivalent transfer situation where only present groups are involved. In this spirit, consider two communities etched into the side of a mountain. There is an untraversable ravine that will always separate the peoples of the two communities. The upper community (the present) can exert an influence on the welfare of the lower (the future) by reinforcing against rockslides, maintaining the purity of the mountainside stream, or even floating grain down that stream. But there is no possibility for reciprocal influence.¹⁶ What sacrifice of its own welfare should the upper community make to help the lower?

To answer this question, the upper community could conceivably seek guidance from the social welfare function. Clearly that function would treat the welfare of citizens in the upper and lower communities in identical fashion. If the upper community decided to maximize social welfare, the tradeoff ratio that would guide its actions would be one to one. (This argument extrapolated to the present-future situation would suggest that the discount rate for generations' utilities should be zero.) But it would be highly unusual for an actual community to follow this standard. At present the United States does not see fit to give away even 1 percent of its GNP in foreign aid. Quite obviously we adopt a self-interested point of view with regard to transfers among present groups or, to state the point more gently, we include only a limited population when we exercise our social welfare function. Can we expect, or would we like to see, the present be much more altruistic toward the future?

The Risks of Economic Growth

The predictions of antigrowth forces have been shown to be unduly pessimistic. There is no dialectical force to the argument that economic growth must lead to a diminution in welfare. But the argument that growth, though good on average, raises the probability of various disastrous events, is more convincing. This makes it important to ask: What are the risks and dangers of unhindered economic growth?

In assessing these risks, it is useful to draw a distinction between those, like thalidomide deformation, that fall on individuals, and others, such as the melting of the polar icecaps, that affect society as a whole. Where individual risks are concerned, the economist's concept of *externality* pro-

vides the appropriate guide to policy. We do not want individuals imposing risks on others, particularly if those who must bear them will be unable to gain compensation for any losses they suffer either because they live at a far future time, or because causality is difficult to prove, or because transactions costs make claims for suit uneconomic. In discussing the adverse effects of nuclear radiation, Herman Kahn has argued that "if you can spread the genetic damage over tens of thousands of years, you have done something very useful."¹⁷ But such spreading would impose costs on individuals not represented in the decision process, costs which are not necessarily balanced by gains to them or to others. Where personal gains (whether to a generation or an individual) can be secured by imposing risks on others, there is a natural tendency to take excessive risks. But what if actions risky to one or a few identified individuals hold out promise of great gain to others? In that case, the fact that there is no institutional framework for extracting compensation for conferred benefits is just as threatening. It will tend to prevent enough risks from being taken. In protecting some potential recipients of experimental treatment, for example, the FDA may have slowed the introduction of many beneficial drugs.

Some growth measures create risks for particular individuals; others generate more societal risks. If we are to formulate sensible policies, we must decide whether we prefer to see misfortunes suffered by a few people or by everyone at once. The image of a roulette wheel makes the contrast vivid. Say that each individual in society had to place most of his life's chips on one number, and, if the ball came to rest there, lose them; would we choose to have all individuals play the same number? How do we feel about the choice between "Well, at least some of us will survive," and "We'll all go down together?" If misfortunes were universally shared, we would experience a more equal income distribution and, to the extent that relative income is important, less envy and more welfare. But this shared misfortune concept rules out the possibility of society as a whole having sufficient resources to compensate those who were unlucky. If significant redistribution were feasible, and could be agreed upon before any lotteries were run, then we should like risks to be more individual and less societal.

The societal risks of growth have had the more vocal opponents. We hear that we are going to run out of power, plunder our resources, ransack our genes, or push our society into disintegration. Some such potential crises have been dismissed above. Many others seem compelling and deserve study in much greater detail than is possible here. It seems best to concentrate here on what degree of risk we would like to see society as a whole assume. First, if there are no setbacks, we are not being risky enough. (Bridge experts point out that if all your contracts are succeeding, you are not bidding enough.) In order to reduce risk, we must sacrifice something else we value, perhaps even growth itself. When the price

of that sacrifice gets too great (at the margin), we should live with the remaining risks. By way of analogy, economists point out that the ideal traffic safety program involves some traffic and some safety. We could, of course, have perfect safety merely by outlawing the automobile, but that would make travel more difficult.

If the strategy I propose were followed, economic growth would not proceed at a smooth exponential pace, but rather at variable speeds.¹⁸ Once in a great while it might even go in reverse. Since times of sluggish contraction are more painful than equivalent periods of rapid expansion are pleasurable, we should sacrifice some speed of average growth to smooth out fluctuations. But the final result would still be an upward journey.

But what of the far future? We have no conception of the cumulative effects of our actions. There are too many things that could go wrong. When addressing this frequently heard concern, I suggest that one employ an expedient rule of thumb and simply ignore calculated dooms that are more than one hundred years away.¹⁹ They have to take their place in line behind the many potential cataclysms that may intervene between now and then, the most apparent involving some form of warfare. If everything goes smoothly in the interim, the accelerating pace of scientific and technological progress will make our world and its problems almost unrecognizable a hundred years from now. It is hard to conceive of a growth-induced disaster that could not be averted or deflected by some significant scientific innovation. Indeed, nothing more than the successful exploitation of fusion energy would splash rosy paint on many black predictions of recent years. If growth and its risks are our concern, the foreseeable future should be our focus.

Beyond the Economic Perspective

If prescription for social policy is our goal, we should look for areas in which we can improve the present state of affairs. Now the neoclassical model of economics correctly tells us that if markets were everywhere perfect, we would not have to worry about growth or any of the other targets of social policy. The uncoordinated outcome would be efficient. But markets are hardly perfect. Flaws are particularly noticeable in markets for risky assets and capital, key ingredients to the whole growth process. This observation should forewarn us that something may go wrong.

The neoclassical model requires not only that we trade on perfect markets, but that we be utility isolationists and care not one bit about the welfare of others, nor about their decisions. However, where growth, its attractions and liabilities are concerned, no stipulation could be further from reality. In the short run, we may worry that a new factory pollutes the clean air, a situation that an economist might label a static

externality. And over the course of time, such matters can be even more consequential.

Henry Ford and other automotive pioneers gave an all-time boost to GNP by initiating mass production technology for automobiles. Our situation will never be the same. More jobs and higher incomes may be the least of the long-term effects. We have noxious oxides; we have a mobile society; we have trysts in motels and back seats. What would our society be like without automobiles? The question is mind boggling because virtually any answer must project a world so different from our own. Assume that we could have stopped the automobile and had this different world. Would we like it? A lot depends on the viewpoint we take. There are always advocates for the good old days, but most of us have been molded into patterns by our present society and its accouterments. It would not be easy to forego our new developments. Economic growth goes hand in hand with new products and new technologies, and these in turn produce changes in society and in its yardsticks for evaluating its own welfare. Here, too, we will need something more dynamic than the neoclassical paradigm which deals with a single society where tastes don't change.

From a policy standpoint, this discussion has focused primarily on economic welfare. In that limited domain, it is evident that slowing growth will not produce the optimal situation. But MEW and income distribution may not be all we care about. Religion, justice, independence, racial equality and brotherhood, the strength of the nuclear family, and sexual liberation are perhaps more important to our welfare.²⁰ If we could demonstrate an adverse causal relationship between economic growth and these social variables, we might wish to slow growth despite the economic consequences.

One of the nice things about economic growth is that it is observable and measurable. Not only that, but each individual picks up his own share. He can see clearly how he is doing. Social decline, on the other hand, is a fuzzy concept, difficult to observe, and not personal to the individual. This contrast introduces a danger into the growth debate. Where we are surely making progress, economically, progress can be documented. Where we may be backsliding, socially, we can hardly tell where we have been. Our politicians can fool us, and we can fool ourselves. Some people might argue that we were better off in the good old days with fewer material goods but better values and a more cohesive society. Nevertheless, if we had to vote, I doubt whether many people would go back. And that is probably the way our future brethren will feel about our time.

If, in fact, growth is not in the best interest of society, economists should not be the ones to tell us, for economists are the gurus of growth, with the assignment to further it and guide it in profitable directions.

Growth in return is supportive of the central concern of the economics profession, the material well-being of society. The limited jurisdiction of economists, therefore, cannot support a very stimulating discussion on the merits of growth. It's time other tradesmen joined the debate.

REFERENCES

1. My Kennedy School colleagues have provided me with helpful comments.
2. This terminology may seem to prejudice the issue. That is exactly what Thomas Schelling, who proposed it to me, intended.
3. W. Nordhaus and J. Tobin, "Is Growth Obsolete?" *Economic Growth* (New York: National Bureau of Economic Research, 1972). This piece provides an excellent scholarly survey of the growth-welfare relationship.
4. Even if they did, there could be some more complex computational problems if we had to worry about sacrificing present for future GNP. We would have to convert to MEW, our true objective, define our tradeoffs, and then reconvert to GNP.
5. A man inclined to chubbiness might point out that his recent gain in weight merely reflected the replacement of low-density fat with muscle of high specific gravity. He might draw an analogy between poundage and GNP. Both are convenient for certain purposes, but neither is what we really want to measure.
6. A logical extension of this approach would suggest that our physicians, like their fabled Chinese counterparts, should receive payment only when their patients are healthy.
7. Those who are interested in preserving the pristine nature of our natural environment might not be so happy about this. People would have more time to litter our beaches and crowd our parks.
8. In my elementary school, twenty-odd years ago, there was a student of excessive height who might have taken growth inhibitors. His parents chose against this course for the procedures were experimental and therefore somewhat dangerous.
9. Nordhaus and Tobin ("Is Growth Obsolete?") indicate that economic growth has been accompanied by an increase in MEW. There is, of course, no logical reason why this pattern couldn't be broken in the future.
10. This parable does not capture the richness of our present energy situation. The production of nuclear energy entails substantial capital costs in terms of research, construction, and learning from inefficient initial installations, costs which could be reduced by delaying the year of introduction. The concentrated and regulated nature of the nuclear power industry further complicates the optimization problem. Despite these factors, I would bet that nuclear power will phase into use in a pattern that roughly approximates what dynamic programmers prescribe.
11. M. Weinstein and R. Zeckhauser, "The Optimal Consumption of Depletable Resources," *Quarterly Journal of Economics* (forthcoming); "The Optimal Consumption of Recycleable Resources," Kennedy School Discussion Paper No. 13B

(October 1972). Recycling is not the solution for oil, because the alternate technology of nuclear power generation is cheaper.

12. Our ignorance is reflected in the traditional economic assumption that population growth is an exogenous variable. In a very rough sort of a way, it seems that as we pass up the industrial development income ladder, children become more of a consumption and less of a production good. This in no way implies that more wealth would mean less population; we know very little about the long-run relation between income and demand for children.
13. Lester Thurow, "The Impact of Zero Economic Growth on Personal Incomes," mimeo, M.I.T., August 1972.
14. An adherent of the fixed-all-time-consumption-of-resources view of economic development would point out that at some point in the future, assuming humans continue to exist, per capita welfare will have to diminish. His decisions in providing for the future might depend on how much he thinks he will be benefiting our more affluent immediate descendants as opposed to the impoverished residents of the far future.
15. Some analysts might argue that the utility from altruistic behavior should be our guide, that if we get sufficient utility from providing for the future, then we should. This is the philosophy underlying some arguments that the social rate of discount should diverge from the interest rate we observe on the market. Starting from a very different philosophical basis, one could argue that the government is the custodian of the future and should take full account of any externalities that will befall it, even though compensation can never be charged. Acceptance of this point of view would lead to a high rate of transfer to the future. A third approach, similar in consequence to the second, would make intergeneration transfer decisions on the basis of a hypothetical contract that would have been agreed to by all future citizens standing behind a Rawlsian "veil of ignorance." The transfers would be equitable, because at the time the agreement was drawn, the parties would not know who would live when.
16. The mountain analogy gets slightly modified if we recognize that generations overlap. Everyone has a fixed spot on the mountain. He can trade with his immediate uphill neighbor; once those transactions are completed, he can trade with the man just below. In this way, each generation can employ its early life wages to purchase the total extant capital stock during its midyears, only to resell it and consume the proceeds before its death. Given natural relationships between generations, particularly within families, much of this capital transfer occurs without recompense. Each generation gives to the next, especially in areas like support in the early years, with little expectation that they will ever be paid back. Indeed, it seems that much of the motivation for each generation proceeds from its desire to continue the process of transfer forward. A sometimes cited externality is the satisfaction older generations (say, grandparents) receive when younger generations pass income forward (say, parents to children). Perhaps this has something to do with desires for immortality; at any rate, it is interesting to note that our society has rules against perpetual bequests.
17. Herman Kahn, *On Thermonuclear War*, 2nd ed. (Princeton, N.J.: Princeton University Press, 1961).
18. There is quite another source of variation. Technological advance is hardly the smooth exponential process posited in most economists' models. An invention like

the transistor, which can provide a measurable boost for the total economy, may come along only once in a great while.

19. Economists' models, relying on unchanging assumptions, frequently show a decline, say, in income beyond some point t' . If this information is to be used for policy, it is important to know whether the real-time equivalent for t' is five, one hundred, or one million years.
20. A survey on this matter might not tell us much beyond identifying areas where consciousness is high. Perhaps people pay the most attention to the objective which they see as potentially most threatened. For example, when asked to name their most valuable consumption item, few individuals would select oxygen or water. Fortunately, for the present, neither seems likely to be taken away.