

Reflections on the Meaning of *Efficiency*: Can Efficiency Be Separated from Equity?

Uwe E. Reinhardt†

"All this talk about VALUES makes me nervous!
What about EFFICIENCY?"

Economist, overheard after a workshop
on reform of the U.S. health system.

The word *efficiency* has taken on a powerful role in the current debate on health policy and, indeed, in public policy in general. It is widely taken for granted that an *efficient* approach is *ispo facto* superior to an *inefficient* one. The fastest way to eliminate a rival policy from the field is simply to brand it *inefficient*. Usually, the involvement of government in the implementation of a policy is taken as *prima facie* evidence of inherent inefficiency.

In the vernacular, to be *efficient* means not to be *wasteful*. On that intuitively appealing definition, every American claims to favor *efficiency*, at least ostensibly.¹ But what does it actually mean "not to be wasteful"? Surely, we can all think of simple illustrations of *inefficiency*—for example, driving a car with a hole in the gas tank, cooking five-pound steaks for each of one's dinner guests or implanting a pacemaker into a patient who does not need one. These are the easy cases. One might engage professional economists to analyze them; but any lay person would do just as well.

What about larger contexts—such as organizing an entire health system? How can we know when a health system is *efficiently* organized, and when it is *inefficient*? For example, if a publicly owned clinic gives a woman, free of charge, a screening mammogram for which she would have been willing to pay at most \$30, but which costs \$60 to produce, is that an *inefficient* use of resources? Would it be more *efficient* simply to give her the \$60 in cash and to let her decide whether or not to purchase a mammography test with that money or to spend it on more desired commodities?

Suppose Figure 1 represented the demand for well-baby care by a particular family and the supply-curve for that care faced by that family. Suppose, next, that this family was given first-dollar health-insurance coverage for well-baby care. Are economists correct in labeling the shaded area in the diagram the

† James Madison Professor of Political Economy, Princeton University. Bachelor of Commerce, University of Saskatchewan, Canada, 1964; Ph.D., Yale University, 1970.

1. In fact, of course, one person's *inefficiency* often turns out to be another person's livelihood.

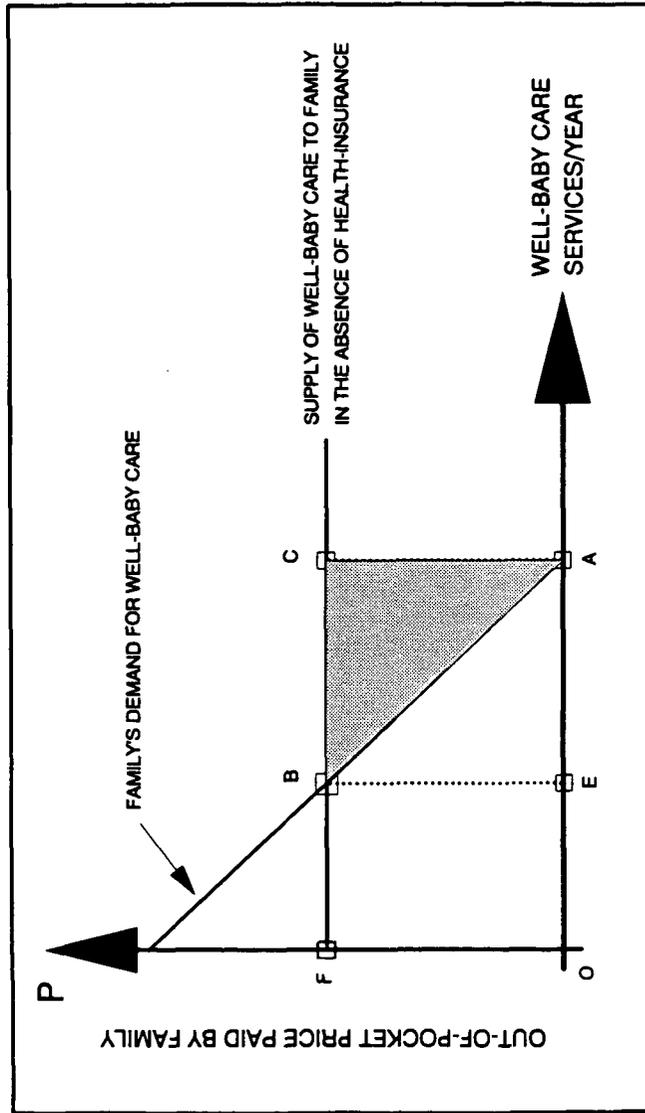
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so-called *welfare loss* inherent in that insurance policy?² Would it be more *efficient* simply to give that family an amount of money equal to the total actuarial cost of its health-insurance coverage for well-baby care?

Following that line of inquiry, are we entitled to assume that the Canadian, government-run health-insurance system, which does offer patients first-dollar health-insurance coverage all around, is *ipso facto* less efficient than the American system which visits substantial cost-sharing on patients and leaves millions of them uninsured to confront the full cost of the health care they consume?

2. The reasoning is as follows: At any utilization rate on the horizontal axis, the height of the demand curve indicates the maximum value (in monetary terms) the consumer attaches to the marginal (last) unit of the service. Following that line of reasoning, the total benefit the household derives from consuming A units of well-baby services per year would be the polygon OABF. The total cost of that consumption rate, however, is equal to rectangle OACF. Thus, the total cost, presumably paid by someone else, exceeds the benefits registered by the family by the triangle ABC. It is said to be the so-called *welfare-loss* associated with first-dollar coverage of this service.

FIGURE 1
THE JONES FAMILY'S DEMAND FOR WELL-BABY CARE



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At the moment, this nation's organ-transplant system relies exclusively on *donated* organs. In some other countries, organs may be sold for cash, sometimes even by living persons. Is our approach *inefficient*? Should we encourage a well-functioning market for transplantable organs in which those who supply organs (or the surviving relatives of a deceased donor) can sell the organs to the highest bidder? Should we perhaps permit a futures market in transplantable organs, replete with call options on particular organs?

It is important to explore these and similar questions at this time, as the nation appears bent upon confronting in earnest the difficult task of reforming its health system. Central to the debate on alternative reform proposals will be judgments by economists on the relative *efficiency* of these approaches and, as noted, these judgments tend to bear heavily upon the decisions of policy-makers. But who audits the economists' judgments? Can we be sure that they invariably apply the concept of *efficiency* with impeccable professional integrity?

Since the late 1970s, for example, many American health economists have advocated a reduction of regulation in health care and greater reliance on market forces, all for the sake of greater *efficiency*.³ There is ample evidence that the policy initiatives set in motion by these recommendations helped to enhance vastly the technical sophistication of American health care and the amenities accompanying the delivery of that care to well-insured patients. But these policies also served to saddle the system with excess capacity all around⁴ and to drive up sharply the prices of health services and health-insurance policies. Consequently, millions of low-income Americans have been driven out of the market for health insurance and for health care, particularly as more and more private insurance carriers began to charge *actuarially fair* premiums, that is, premiums based on the individual's health status (an approach to pricing economists tend to consider *efficient* because it eliminates hidden cross subsidies among the insured).

3. See Milton Friedman, *Gammon's Law Points to Health-Care Solution*, WALL ST. J., Nov. 12, 1991, at A20. Friedman would force each family to spend \$20,000 per year or 30% of its income (whichever is lower) out of pocket before insurance coverage would set in. That degree of cost-sharing would be quite burdensome for, say, a low-income working mother with children. The distributional effect of such a scheme would be vastly different from those of a Canadian-style system. In Canada patients do not share costs at point of service.

4. The average occupancy ratio in American hospitals now is about 65%, yet most hospitals charge prices high enough to enjoy positive profit margins. A recent study of screening mammography led to the finding that the United States now has four times as many mammography machines as would be needed to serve the current utilization rate. See M.L. Brown et al., *Is the Supply of Mammography Machines Outstripping Need and Demand?*, 113 ANNALS INTERNAL MED. 547, 547-552 (1990). Because the typical machine is vastly underused, unit costs per film are high and prices are more than twice as high as would be needed to amortize a fully used machine with a solid profit margin. Remarkably, private payers in this market are willing to pay the higher prices. Because screening mammography is a typically *uninsured* preventive service, it can be said that the private market actually works to deny poor American access to mammography screening *because the nation has too many mammography machines*.

Several years ago, a group of economists took stock of the shift to a more market-oriented health policy. In his introduction to the series of essays resulting from this effort, the editor of the volume asserted:

It appears that competition has increased substantially among providers and among insurers and health plans since 1977, perhaps more than anyone predicted or thought possible. Economic theory would suggest that this increase in competition should have resulted in a more efficient allocation of health services. ... But competition may have succeeded only in *improving* the allocation of health resources. In the next ten years, I believe, we will have to combine a *better* allocation of resources with a more equitable distribution of these resources.⁵

What is one to make of such a statement, particularly since most of the "competition" the author is talking about took the form of competition in high-tech equipment and amenities—leading, as noted, to vast excess capacity in the health sector—and not in classic *price-competition*? What does the author mean by "*better allocation*" of health-care resources? In the context of health policy, are *equity* and *efficiency* really as separable as this passage suggests? And how did the author define and measure *efficiency* in the first place? (In fact, he did not make his definition explicit, presumably on the thought that every reader would know what *efficiency* is.)

To judge the merits of the economists' judgments in these matters, it may be well to review carefully what economists actually mean by the term *efficiency*, and how compelling their conventional applications of that term are in practice. It will be seen that economists have endowed the term with a precise, technical interpretation that completely divorces it from *desirability* in the sense that even (properly practicing) economists themselves might prefer a patently *inefficient* allocation of resources to a technically *efficient* one. Very few lay persons fully understand this fine point.

I. THE CONCEPT OF PARETO-EFFICIENCY

The most popular concept of *efficiency* used by economists, mainly in abstract theory or in the class room, is one first formulated by the nineteenth-century economist Vilredo Pareto, to wit:

5. Warren Greenberg, *Introduction*, J. HEALTH POL. POL'Y & LAW, Summer 1988, at 223-24 (emphasis added).

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PARETO EFFICIENCY

*AN EFFICIENT ALLOCATION OF RESOURCES IS ONE FROM WHICH NO PERSON CAN BE MADE TO FEEL BETTER OFF WITHOUT MAKING ANOTHER PERSON FEEL WORSE OFF.*⁶

In this guise, the term *efficiency* is meant to reflect *social welfare*, because the concept is based on the way people “feel” about different allocations of economic privilege among them.

Pareto-efficiency is absolute in the sense that a resource allocation either is or is not *Pareto-efficient*. Often that stringent test is not necessary in policy analysis. It suffices to rank alternative allocations in terms of their *relative efficiency*. For that purpose, economists employ the concept of *Pareto superiority*.

PARETO SUPERIORITY

*ONE ALLOCATION IS DEFINED AS PARETO-SUPERIOR TO ANOTHER IF AND ONLY IF IT MAKES AT LEAST ONE PERSON FEEL BETTER OFF AND NO ONE FEEL WORSE OFF.*⁷

Figure 2⁸ depicts a two-person society confronted by a resource-constrained set of opportunities to allocate degrees of happiness (“utility”) among them. Any point on the trade-off possibility frontier labeled XY is *Pareto-efficient* in the sense that it is impossible to enhance Smith’s happiness without making Jones less happy. Point Z, while not *Pareto-efficient*, is nevertheless *Pareto-superior* to point A, because both Smith and Jones are happier there than at point A. In fact, the entire shaded area in Figure 1 is *Pareto-superior* to point A, although only points lying on or beneath the trade-off possibilities frontier XY are *feasible*. Point R, for example, is *Pareto-superior* to point A but not attainable with the resources at hand. By assumption, only points on or below the solid curved line are attainable with the resources at hand.

6. WILLIAM J. BAUMOL, *ECONOMIC THEORY AND OPERATIONS ANALYSIS* 527 (1977); *see also* LEE S. FRIEDMAN, *MICROECONOMIC POLICY* 26 (1984).

7. FRIEDMAN, *supra* note 6, at 36.

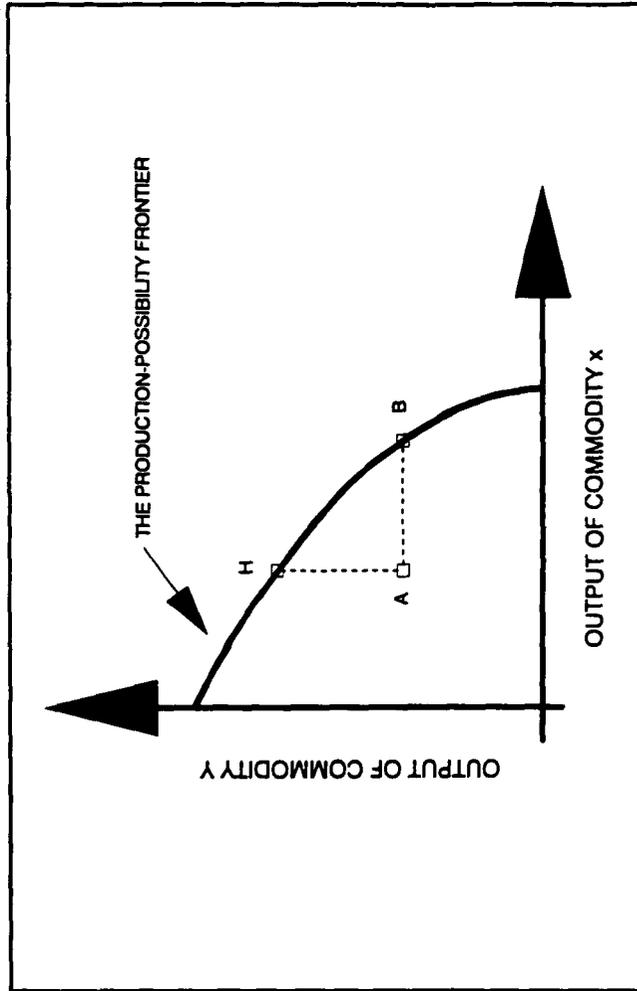
8. *See id.* at ch. 2, figs. 2-4.

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It can readily be agreed that a policy that moves the two-person society depicted in Figure 2 from allocation A to either H or B (or to any allocation anywhere in the shaded area of Figure 2) enhances *social welfare* all around, because by definition it leaves no single individual less happy than before and makes at least one of them happier. How much of an analytic insight this construct represents can be debated. Although the construct is much celebrated by economists as an intellectual breakthrough of sorts, one might also view it as a tautology. Yet it would be difficult to implement even this tautology in practice, because the happiness that would be registered by individual human beings in response to different allocations might not be easily readable.

The axes in Figure 2 represent *degrees of happiness* of two individuals. They are purely subjective measures of personal well being, judged by the affected individual him or herself, and not by someone else—e.g., a parent or the economist's favorite analytic analogue of a parent, the legendary benevolent dictator. Very often, however, economists jump from the construct represented in Figure 2 to one in which the axes represent not human well being, but merely quantities of commodities. For example, the introductory chapter of virtually every freshman textbook in economics contains a graph such as Figure 3 that depicts three distinct output mixes, two located right on the so-called *production-possibility frontier* (points H and B in Figure 2) and one located beneath that frontier (point A). This *production-possibility frontier* depicts, for each quantity of the one commodity, the *maximum* output of the other commodity that could be wrung out of the available resources if the latter were used to its fullest capacity. On this definition of the frontier, both output mixes H and B on the frontier are defined as *efficient*, while output mix A (or any other output mix beneath the frontier) is deemed *inefficient*.

FIGURE 3
EFFICIENCY IN THE PRODUCTION OF OUTPUT



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This concept of *efficiency* has enormous intuitive appeal. It seems related to *Pareto-efficiency*, although it is actually not the same concept (a circumstance not usually made clear to students). While a move from output mix A to either H or B (or points in between) certainly will make available more output all around, Figure 3 tells one nothing about the human happiness such a move will beget. Can we be sure the move actually does make some people in society better off without making others worse off? In other words, can we be sure that a move from, say, point A to point C actually enhances *social welfare*?

Presumably, the writers of freshman texts have in the back of their mind the argument that, with more output of one kind and not less of another, it ought to be *possible* somehow to distribute the extra output in a *Pareto-efficient* manner, so that a move toward the *efficient* output frontier in Figure 3 can be viewed as at least a potential enhancement of *social welfare*. The question, of course, is whether it can reasonably be assumed that this potential will *actually* be exploited by society. What if one harbors the suspicion that this potential will not be exploited and that the move toward greater output *efficiency* actually creates heightened social tension? Should the analyst then project the more *efficient* allocation as also more desirable? Or would it not be all the more important in such cases to remind users of the analyst's output that greater *efficiency* does not necessarily imply enhanced *social welfare*? Would failure to highlight this *caveat* perhaps border what one might call *von-Braunian motion*, after Tom Lehrer's famous song in which he satirizes Nazi Germany's top rocket technician Wernher von Braun with the ditty:

"Vonce rockets are up,
who cares vere zey come down,
dat's not my department,"
says Wernher von Braun.⁹

Suppose, for example, that commodity Y in Figure 3 represented some new, high-tech medical intervention and that more of it could be produced without causing reductions in the output of any other commodity. Suppose next, however, that the associated rearrangement of the economy has been such that only well-to-do patients will have access to the new medical procedure. On these assumptions, can we be sure that a move from A to H or B would enhance overall *social welfare*? Would we not have to assume the absence of *social envy* among the poor and of guilt among the well-to-do? Are these reasonable assumptions? Or should civilized policy analysts refuse to pay heed to base human motives such as envy, prevalent though it may be in any normal society?

These questions are not mere pedantry. They go to the heart of contemporary health policy. When economists such as Nobel Laureate Milton Friedman

9. TOM LEHRER, *Wernher Von Braun*, on THAT WAS THE YEAR THAT WAS (Reprise 1965).

propose health systems that implicitly permit the quantity and quality of health care to vary with family income and then call that approach more *efficient* than, say, the more regulatory but also more egalitarian Canadian system, are economists playing it straight, or are they merely selling preferred ideology in the guise of science?

II. THE KALDORIAN CRITERION

We may revisit the previous questions more precisely in terms of our earlier Figure 2 that has degrees of happiness (rather than quantities of output) on the axes. Consider now a move from the *inefficient* point A in that diagram to an *efficient* point D, which lies outside the shared area of *Pareto-superior* allocations. Would such a move be a social improvement? In other words, is a move from a *Pareto-inefficient* allocation of resources (A) to a *Pareto-efficient* one (D) *ipso facto* a desirable move, as is so often implied in the debate on health policy? Would not most people believe that the answer is an unambiguous "Yes"?

At point D, Smith is vastly better off, but partly at the expense of Jones' happiness. That sort of reallocation might obtain, for example, if we took the allocation of health-care resources in Canada out of the hand of government and entrusted it instead to free market forces. Well-heeled economists (like Smith) might not have to wait as long as they do now for an MRI scan or a coronary by-pass; on the other hand, Canada's poor (the Joneses) might be priced out of the health system altogether, as are so many of America's poor today.

To cope with this troublesome issue, the British economist Nicholas Kaldor proposed a *social welfare* criterion that is now packaged implicitly into most benefit-cost analyses performed by economists, usually without alerting the users of such analyses to the troublesome limitation inherent in that criterion. This criterion can be expressed as follows:

THE KALDORIAN CRITERION

A REALLOCATION OF RESOURCES IS A SOCIAL IMPROVEMENT IF THOSE WHO GAIN FROM THAT MOVE VALUE THEIR GAIN SUFFICIENTLY SO THAT THEY COULD, IN PRINCIPLE, BRIBE THOSE WHO LOSE FROM THE MOVE INTO ACCEPTING THAT MOVE, EVEN IF THE BRIBE IS ACTUALLY NOT PAID.

To highlight the tenuous ethical foundation of Kaldor's criterion, one might call it the *unrequited-punch-in-the-nose* criterion of *social welfare*. Suppose, for example, that I feel very aggressive today and therefore would like to

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punch you in the nose. An honest referee (an economist) asks me what I would be willing to pay for that privilege. Suppose the maximum I'd be willing to pay were \$1,000. Next, the honest referee asks you how much you would have to be paid to receive that punch in the nose without hitting me back. Because you are strapped for cash, you might accept the punch for \$600. The referee (our economist) is ecstatic, for (s)he perceives here the opportunity to enhance *social welfare*. Consequently, the deal is struck, you kindly present your precious nose, I punch, you bleed and hold out your hand in anticipation of my payment of \$1,000. Alas, I walk away happily, along with my \$1,000, which I refuse to surrender. Not to worry. The honest referee (our economist) will soothe you with the expert assurance that, according to Nicholas Kaldor, and in principle, we just have witnessed a major enhancement in *social welfare*, to the tune of \$400, even though the expected \$1,000 bribe is not actually paid. It is to be hoped that you have enough respect for the referee to accept this verdict gracefully, and you probably will, if you accept the benefit-cost analyses typically sold by economists to policy makers.

Although this illustration may seem beastly and absurd, it can easily be adapted, with only minor modifications, to the context of environmental pollution, to health care or to many other situations in which public policy bestows benefits upon one group of people at the expense of others. One is struck by how readily and how uncritically many economists apply the Kaldorian criterion to their analyses of such policies—particularly younger economists, many of whom no longer seem to explore very carefully the philosophical and ethical underpinnings of their profession and instead concentrate on mere analytic technique.

Among more thoughtful analysts, the Kaldorian criterion *is* deemed highly suspect. As Baumol remarks in his chapter on welfare economics: "In my view, the Kaldor test operates on the basis of an implicit and unacceptable value judgement."¹⁰

In their effort to overcome the obvious shortcomings of the Kaldorian welfare criterion, some economists have proposed to proceed in terms of *social-welfare* functions; that is, constructs that convert the happiness experienced by individual members of society into an overall measure of *social welfare*. In their lectures, economists draw such functions with great elegance.¹¹ In fact, resort to social welfare functions amounts to throwing in the towel on attempts to avoid politics in the assessment of public policy, for the relevant parameters of the *social welfare* functions one might use for that purpose are inherently *political*, even in the abstract.

10. BAUMOL, *supra* note 6, at 530.

11. See *infra* fig. 4; see also FRIEDMAN, *supra* note 6, at ch. 2, figs. 2-7.

FIGURE 4
THE ECONOMIST'S COP-OUT: SOCIAL WELFARE FUNCTIONS

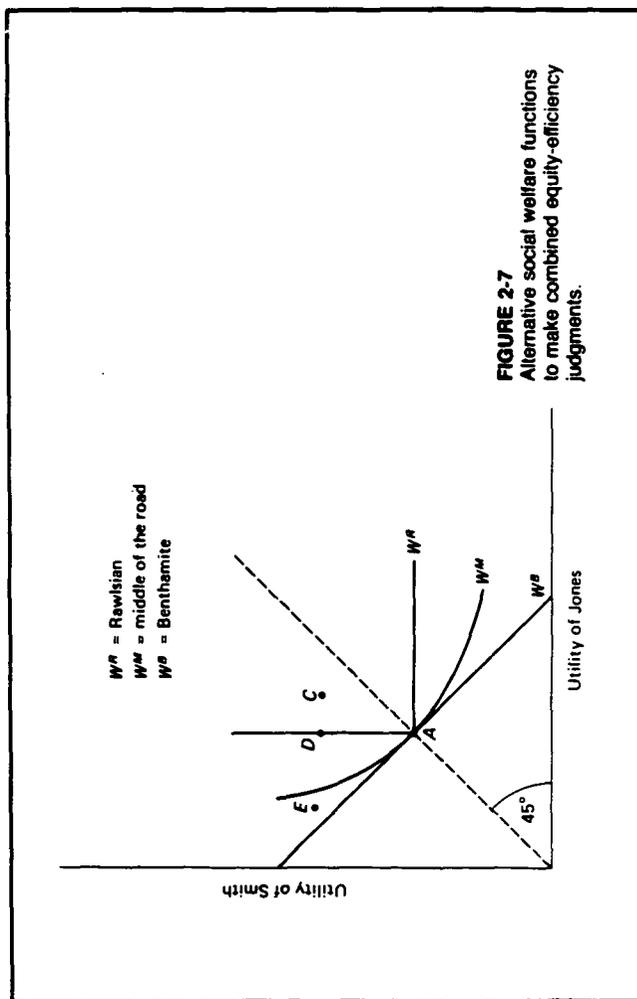


FIGURE 2-7
Alternative social welfare functions
to make combined equity-efficiency
judgments.

III. CONCLUDING OBSERVATIONS

Although, in their abstract theories, economists have endowed the term *efficiency* with impeccably precise, technical meaning, in practical applications that term seems to be widely misunderstood and misused, even by economists, who should know better.

There is the general presumption among the public that greater *efficiency* is in and of itself a desirable goal. One can readily agree to that interpretation if greater *efficiency* implies reaching a given, fixed goal, characterized by a given distribution of economic privilege, with a lower expenditure of real resources. Lay persons usually appear to assume this construct when they endorse greater *efficiency*.

Alas, contexts in which alternative policies leave outcomes unchanged (in terms of the distribution of economic privilege) are relatively rare in practice—certainly in the realm of health policy. More often than not, a move from what economists would technically define as an *inefficient* allocation of resources to an *efficient* one inevitably redistributes economic privilege among members of society; it bestows benefits upon some members of society at the expense of others. In those contexts, greater *efficiency* may represent an increase in *social welfare*, or it may not. It is a point every economist has clearly grasped once in his or her graduate-school career, but one many of them seem to forget in the course of their professional careers.

It is perfectly reasonable in policy analysis to separate considerations of *equity* from considerations of purely technical *efficiency*, as long as the analyst is impeccably clear on his or her precise meaning of the term *efficiency* and as long as the analyst avoids lapsing into *von-Braunian motion* by elevating *efficiency* to a position *ueber alles*.¹² Sometimes a consideration of *efficiency* by itself may be helpful, even in health policy. At other times it may be analytically elegant, but only trivially relevant to the conduct of public policy.

Indeed, to begin an exploration of alternative proposals for the reform of our health system without first setting forth explicitly, and very clearly, the *social values* to which the reformed system is to adhere strikes at least this author as patently *inefficient*: it is a waste of time.¹³ Would it not be more *efficient* merely to explore the *relative efficiency* of alternative proposals that do conform to widely shared *social values*?

12. Above all.

13. See generally Uwe E. Reinhardt, *Research and Politics in Health Care*, 4 DECISIONS IMAGING ECON., Spring 1991, at 19-26; Humphrey Taylor & Uwe E. Reinhardt, *Does the System Fit?*, HEALTH MGMT. Q., Third Quarter 1991, at 2-10.