
Facts, Values, and the Burden of Proof

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The very terms “efficient” and “inefficient” are terms of normative and not positive economics, so much the better: immense confusion has been sown by the pretense that we can pronounce “scientifically” on matters of “efficiency” without committing ourselves to any value judgments.

—Mark Blaug, *The Methodology of Economics* (2d ed.)

I examine here the connection between facts, values, and the burden of proof, and I suggest a relationship that is always present, though seldom acknowledged. We like to think of ourselves as conducting value-free scientific inquiry, yet values inevitably intrude. This inevitable intrusion does not necessarily suggest the abandonment of the attempt to keep facts and values separate, but it does suggest that we ought to make plain our prior moral commitments as an aid to those evaluating our findings.¹ This revelation is especially desirable in the design of experimental frameworks used to interpret the policy significance of the “evidence.” Where one places the burden of proof in such a design is closely related to such prior moral commitments.

I begin by reviewing the fact-value divide and the concepts of efficiency that usually accompany it. I consider some well-known problems with the concept of efficiency and

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1. Sam Weston (1994) appeals for the retention of the positive-normative distinction even though a thoroughgoing value-free economics is impossible.

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show that these problems necessarily imply the intrusion of values into this apparently “scientific” idea. I speculate on how this intrusion may be handled appropriately by shifting the focus from individual policies to policy regimes. I then turn to an examination of the role of placing the burden of proof in appeals to “evidence” and show what this placement implies about the fact-value divide. I conclude that values necessarily intrude here as well, perhaps more subtly and dangerously. In fact, because of the nature of “evidence,” there is a remarkable connection between the problem of value neutrality at these two contextual levels. I provide an extended example by looking at the debate between Paul David, on the one hand, and Stan Liebowitz and Stephen Margolis, on the other, with regard to determining the efficiency of alternative standards. This example illustrates the general situation and forms the basis for my conclusion.

Efficiency and All That

Positive and Normative Economics

Students of economics are told from the start that good scientists are careful to separate facts and values. Positive economics deals with “facts” about how the world works. Normative economics deals with what we ought to do with knowledge of those facts. There is a widely shared conviction that good scientists, as such, ought to keep their moral sensibilities out of the analysis.² In any case, we know from David Hume that one cannot get an “ought” exclusively from an “is,”³ so it behooves the good scientist to be forthcoming about the values introduced in the derivation of any policy conclusion.

This fact-value divide has received much critical scrutiny, particularly in the social sciences. The long development of welfare economics can be understood as an ongoing attempt to derive normative propositions from certain minimum accepted norms, such as agreement that the valuations (utilities) that are to count are those of the economic agents who will be affected by the policy in question. In some ways, welfare economics, with its use of the concept of efficiency, is made to appear every bit as “value free” as positive economics. As such, it has been the subject of much debate.⁴ A brief overview follows.

Problems with Efficiency: What Does Efficiency Mean?

Economists have searched long and hard for a concept of efficiency that is “objective” or value free.⁵ An economic outcome consists of an array of goods and services, prices, and

2. Of course, this proposition itself is a normative one. Once it is accepted, however, the rest is supposed to follow logically.

3. But see Putnam 2002, 14–15.

4. A competent summary is Blaug 1992, chap. 5.

5. The term *objective* has at least two possible meanings: free of ethical or moral judgments; and epistemically objective, as opposed to “subjective.” As Hilary Putnam (2002) explains, the second meaning is not

states of being of different individuals that are in themselves incommensurable. To pronounce a particular outcome more or less efficient than another, one must overcome this “apples and oranges” problem. Commonly, one resorts to the valuations that affected individuals place on the outcomes. This approach obviously involves the presumption that individual preferences *ought* to be what counts when deciding efficiency issues. This procedure, in itself, however, merely *defines* efficiency. No value judgment is involved (beyond that of supporting a definition) unless one says something like “efficiency is good” or “a more efficient outcome is a *preferred* outcome.” When we take this step, as we often do in policy discussions, we are saying that we believe individual preferences ought to count in deciding which economic outcomes are preferable. This approach may strike readers as eminently reasonable. If what is “efficient” is defined as what the “people prefer,” how can we oppose the definition? Is it not the quintessence of “economic democracy”?

As is well known, however, numerous practical difficulties arise in deciding what “people prefer” and, indeed, what this statement means. When a change is contemplated from which all of the involved individuals would clearly gain (that is, they can be confidently said to prefer that the change be made), then there is little ambiguity, and we have a *Pareto improvement*. The most common difficulty arises, however, when some individuals gain and others lose. In such “mixed” situations, we have to resort to so-called compensation tests to judge whether the gains outweigh the losses. If we take this leap, we are saying in effect that when matters of efficiency are decided, the distribution of gains between individuals is not relevant or is something about which the economist should remain agnostic. A standard defense is that the distribution might be relevant, but is a separate issue—we ought to make the pie as large as possible before we consider how it ought to be divided up. This approach involves an additional value judgment, and clearly it is a much less plausible and easily defensible position than the one that arises in the simpler situation where no one suffers losses. To be sure, this position still represents a kind of economic democracy, claiming something like “more people prefer this outcome” or “the intensity of the preferences in favor outweighs the intensity of the preferences against” and that “losers” ought not be able to “hold out” against “winners” in the face of changes that are manifestly beneficial.⁶

This efficiency standard is widely accepted in economic discussions and has penetrated deeply into the policy and legal environments. The situation is complicated because the word *efficiency* has a very strong colloquial connotation, and its meaning in economic policy discussions is often confused with its meaning in the natural

a tenable arbiter in the fact-value divide, and one cannot distinguish positive and normative statements on the basis of their knowledge status or how one came to know them. Therefore, one might say that all knowledge is subjective.

6. At the global level, we must face a host of well-known problems associated with the obvious connection between the size of the gains and losses and their distribution, a connection that implies, among other things, that Pareto optima are not unique and indeed may be infinite in number. There is no “economic” way to choose among such optima; such a choice would have to be informed by noneconomic values. It has often been noted as well that the acceptance of the strict reasoning underlying the Pareto logic in effect implies a value judgment in favor of any status quo.

sciences, where inputs and outputs are much more easily identified and evaluated and no compensation criteria are necessary. The widely accepted efficiency standard gives economic policy discussions a spurious aura of “scientific” objectivity.

*Difficulties in Implementing Efficiency Standards:
The Importance of Dynamics*

Economists encourage this impression of “scientific” objectivity even though they are aware of the insurmountable obstacles to arriving at unambiguous decisions about which changes are efficient and which are not. These obstacles include the well-known impossibility of discerning individuals’ preferences, which requires the use of hypothetical market valuations and the necessity of positing unknowable counterfactuals on the basis of unknowable (even unimaginable) futures. Perhaps an even more important problem with this traditional efficiency standard has to do not so much with its theoretical conception per se as with how it is traditionally used in economics—namely, in the context of the static model of resource allocation. In this context, it has encouraged the kind of attacks, made in the name of efficiency, that we often witness on the unfettered emergence and development of products, organizations, and standards.

In a static context, in which the values of all potential resource uses are known (either with certainty or probabilistically), the technology is unchanging, the set of products is fixed, and no external effects or elements of monopoly exist, it is well known that a “competitive solution” is also Pareto optimal and therefore efficient in the sense discussed earlier. This idealized situation of neoclassical “perfect competition” has unrealistically and unreasonably served as a standard of comparison for real-world situations. For example, in the context of network effects and standards, economists have thought it relevant and meaningful to argue that the presence of such effects suggests that private markets may produce an “inefficient” result. Such arguments, however, rest on an unwarranted presumption of knowledge and a questionable concept of efficiency.⁷

In a dynamic context in which rapid, unpredictable changes are occurring in technologies, product qualities, and product types, static efficiency criteria are necessarily less applicable and compelling. The practical application of static Pareto criteria is clearly out of the question in a world in which the product set is in continual flux. Market processes are truly dynamic when they take place in “real time.” They are evolutionary processes driven by the diversity of perceptions and expectations that individuals have of the value of resources and of the process itself; they are “open ended” and never in (Hayekian) equilibrium; and they are characterized by novelty. For such processes, the traditional types of efficiency assessments, which rest on static models of resource allocation, are completely meaningless. We cannot, for

7. See the introduction in Lewin 2002.

example, apply the traditional utility calculus to choices among technologies that are not yet available. How are we to assess the likelihood that policy action itself may be an “accident” that locks us into an inferior path? Insofar as new technologies depend on future knowledge, which cannot be available in the present, we cannot consider future technologies as part of today’s choice set. Neither can we include the new products, new methods of production, and new modes of organization that these technologies will bring with them. Technological change emerges from the complex interaction of individual visions (including those of the policymakers) that are partial and incomplete and subject to the market’s trial-and-error processes. Static welfare criteria are inapplicable to this process.

Alternative Approaches to Efficiency

Can we then say anything about efficiency? If we can, it will have to be at another level, and it will have to be analytically less precise than (though not entirely unrelated to) static Pareto criteria. Efficiency judgments will have to be made at the level of the institutional framework. If we can learn anything from history, perhaps it is that certain kinds of social, legal, and economic institutions are generally more conducive to the generation of innovation and prosperity than are others. Policy regimes rather than policies should perhaps be the context for this discussion.

An example of institutions’ effect on innovation is monopoly policy in high-technology industries (for an detailed survey, see Teece and Coleman 1998). David Teece and Mary Coleman argue that the nature of these industries has made current antitrust policies obsolete: “[A]ntitrust policy cannot realistically aspire to produce ‘optimal’ outcomes, where ‘optimality’ is measured against some theoretically defined efficiency or consumer welfare criteria” (1998, 815). We need a new way of thinking attuned to the truly dynamic processes of rapid and unpredictable innovation and change, a way of thinking in which competition and monopoly have different meanings than they have in the neoclassical model of perfect competition.

In the light of these considerations, let us return to the question of facts and values. The matter is now much more complicated. If efficiency criteria are to be applied at the level of policy regimes—that is, to the discovery of *principles* of sound policy, rather than to the discovery of individual policies that are efficient in themselves—how are we to derive these criteria? What (meta)principles can we use to inform this choice? Surely, both facts and values are indispensable in deciding which types of policy environments are preferable. History informs us about what is possible and about what types of consequences may be expected, though, to be sure, historical information is never unambiguous (even when delivered by way of fancy econometrics). Once in possession of “all the facts,” however, we must ultimately turn to preferences, to values, to our conception of the “good society” in deciding among the policy environments that indirectly determine the policies actually followed (Yeager 2001). Even then, we may defensibly argue that we are simply providing

“if . . . then” analysis: *if* this is what you value, *then* you ought to adopt this policy regime.⁸ We shall find, however, that another attack on the fact-value divide is not so easily deflected when we consider the use of evidence to choose appropriate policies or policy regimes.

Placing the Burden of Proof

Identifying Policy-Relevant Inefficiencies

All policy discussion is analogous to the conduct of an experiment with (known or unknown) probabilities. As everyone knows, the outcome of an experiment depends crucially on which errors one seeks to avoid—that is, on which errors one considers to be Type I or Type II.⁹ To be more specific, imagine that we are “testing” for the existence or absence of an inefficiency in an established network or standard (with regard to the adoption of a product associated with it) or a particular set of rules. Then two types of experimental design are possible, depending on the choice of the null hypothesis, H_0 , as illustrated in table 1.

The question of *policy relevance* arises. Assume that in order to establish policy relevance, it is necessary to disprove the null hypothesis. The alternative designs

Table 1
Experimental Design in Searching for Policy Relevance

Experimental Design	H_0 = the null hypothesis	H_1 = the alternative hypothesis
Design A	An inefficiency exists. ⇒The status quo is not efficient.	An inefficiency does not exist.
Design B	An inefficiency does not exist. ⇒The status quo is efficient.	An inefficiency exists.

8. See, for example, Hausman and McPherson 1996, 210, for a simple formulation.

9. It should be obvious that the identification of errors as Type I or Type II is driven by value judgments, more specifically by the knowledge (conviction) that although errors are unavoidable, one can specify which errors are more egregious (costly).

reflect the experimenter's presumptions. The essential difference between the two designs reflects *where they place the burden of proof*. Design B places it on those who advocate policy interventions, whereas Design A places it on those who presumptively oppose it. It is always difficult to reject the null hypothesis (and it is sometimes not possible to do so in any practical circumstances). The experiment is designed to make it difficult. Design B is designed to minimize government intervention. Design A is designed to facilitate it. The two designs reflect differences of opinion about the likely benefits and costs of government intervention. But, as already seen, absent any simple way to determine these benefits and costs in a dynamic world, the discussion is likely to reflect more than simply the "objective" facts of the matter.

Fundamental and Specific Normative Judgments: Lessons from Yeager

Using arguments advanced by Leland Yeager (2001), we can distinguish *fundamental* normative judgments and *specific* normative judgments.¹⁰ The former are more sweeping and inclusive, the latter less so. Specific value judgments rely on and are instrumental to more fundamental values; at the highest level, fundamental values are not derived from anything and thus express a value not derived from any more ultimate value.

The distinction between fundamental and specific (or instrumental) values would appear to be logically undeniable. Whatever criterion one uses as a justifying or motivating cause for a preference or action either must be functioning in the service of some more ultimate value or else must itself be the most ultimate value—the last word in the matter. Otherwise, in the attempt to seek justification, one gets either an infinite regress or a circular argument. "Asking how to validate a value judgment means asking what acknowledged higher norm it falls under" (Yeager 2001, 28). Understanding this point suggests a search for the most ultimate value, but clearly neither reason nor induction can inform such a search. "The closest one can come to arguing for a fundamental value judgment is to employ effective rhetoric in identifying an intuition that one expects one's listeners to share" (30).

Yeager argues that in this context all roads lead back to an individual's perception of what constitutes the "good life," the description of which includes evocative words such as *flourishing*, *peace*, and, of course, that most serviceable of all words, *happiness*. The happiness criterion would seem to be the ultimate criterion. If it is not, then some other word will simply have to be substituted for what stands behind

10. Similarly, Sen distinguishes "basic" and "nonbasic" value judgments. He maintains that although "some value judgments are demonstrably non-basic . . . no value judgments are demonstrably basic" (1970, 63, qtd. in Blaug 1980, 133 n.).

(or above) all other ethical criteria, and eventually an end must be found. This point applies to all justification systems. *All* normative arguments ultimately come down to some ultimate criterion, such as happiness or utility broadly conceived. All arguments come down to support or opposition to policies and actions on the basis on how they contribute to or detract from one's conception of what constitutes the "good society." In this sense, all such arguments are and must be consequentialist in nature.¹¹ Recognizing and acknowledging this inevitability leads to better research and policy discussion.

For one thing, such an acknowledgment suggests (echoing a theme expressed by Milton Friedman) that all apparent disagreements ought to be considered potentially resolvable until they are shown to reflect a real difference in fundamental values. It is futile to argue with someone who believes in "evil" or is a pure narcissist, but in many cases apparent disagreements might be resolved if agreement with regard to fundamentals or near fundamentals ("both of us want peace and prosperity for our citizens") were uncovered and the argument is turned to the question of how best to achieve these shared goals.

Ultimate values are not influenced by states of the world, but instrumental values may be. Although factual knowledge about how the world *is* can never influence what one feels about the ultimate good, it can influence one's opinion about how that good ought to be achieved. In economic terminology, factual knowledge may help to clarify the trade-offs involved and help us to choose between instrumental values. "People do not automatically understand all the probable consequences of contemplated changes in policy. They do not fully understand how particular measures may eventually change the general character of their society" (Yeager 2001, 33). In this way, one sees the relationship between ethics and social science, between facts and values.

Yeager also makes another important argument. Words may be inadequate to describe the ultimate values that undergird all normative pronouncements, which is probably why words such as *utility* and *flourishing* are so fraught with controversy. Conversations about this matter thus tend to circulate endlessly as protagonists grasp for ever more expressive terms to denote what we all ultimately strive for, for ourselves individually and for the societies in which we live. Thus, Yeager suggests that such a search may prove fruitless and that, instead, we should focus on the near-ultimate criterion identified by many social philosophers as "social cooperation":

Direct appeal to an actually ultimate normative criterion is rarely necessary. Social cooperation flourishes through institutions, rules, and practices that improve people's chances of predicting each other's behavior and coordinating their activities. Voluntary cooperation accords better than coercion

11. Such consequences must of course include the expected redistribution of wealth noted earlier in the discussion of Pareto criteria.

with each person's having projects, purposes, and ideals of his own and with his having only one life to live. Emphasis on voluntary cooperation warns against imposing unfair sacrifices on individuals for the supposed greater good of a greater number. (2001, 81–82)

Values and the Burden of Proof

One therefore chooses between rival experimental designs in the face of disagreement by an appeal to common values, such as a commitment to “social cooperation.” One may argue that we ought always to support the policy regime that is most conducive to such “social cooperation” broadly understood. We may presume agreement on the ultimate values and argue self-consciously about how to achieve them. Nevertheless, where one puts the burden of proof in this argument is likely to be influenced by one's values, which suggests that *no “scientific research” is completely value free*, if understood in this sense.

The values that enter the discussion are most likely to be specific (instrumental) ones rather than fundamental ones. We may presume that virtually everyone desires policies that produce “peace and prosperity” and policies that provide abundant opportunity for individual “self-fulfillment” or the like. The passionately joined issues pertain to how best we may achieve this ultimate end. Instrumental values may be the outcome of a particular reading of the “facts” of history, but given that the facts never speak for themselves, the rival positions often appear in the guise of irresolvable values.

To illuminate this point, let us return to the experimental design in table 1. Supporters of Design B are saying, in effect, “If you think you have identified a policy-relevant inefficiency, you have to prove it before we will allow you to act on the assumption that it exists.” What justification do they have for taking this position? They would no doubt answer that it is the same justification that we hold in presuming an accused person to be innocent unless “proven” guilty (using a stringent probability level of significance to minimize Type I errors)—namely, that all government action is essentially coercive, and if we are to err, we should do so on the side of minimizing coercion. They are seeking to avoid the costs of incorrectly identifying an inefficiency, while accepting the costs of failing to identify one. Acceptance of Design B and failure to reject the null hypothesis do not entail acceptance of the proposition that, absent the identification of an inefficiency, one has proven that the outcome is efficient. This inferential leap confuses the difference between proving the existence of an inefficiency and proving its absence.

When the role of the (mostly implicit) burden-of-proof presumptions is clarified, it becomes plain that apparently value-free economic discussions almost always harbor hidden prejudices (instrumental values) about the desirability (or otherwise) of state intervention. Bringing this fact to light forces a discussion of the appropriate location of the burden of proof. Should those who propose a state intervention shoulder the burden of showing that it would be beneficial on balance, or should

the opponents shoulder the burden of showing that it would be harmful on balance? When the decision is stated in this stark manner, then, most economists, recalling that all state intervention implies the abridgement of individual autonomy in some way, would have to agree that in theory the former burden is the appropriate one. In practice, however, such reasoning does not always carry the day.¹²

An Example: Antitrust and the Economics of Standards

Judging QWERTY

The U.S. Justice Department's recent case against Microsoft received much attention.¹³ The case rested on, among other things, assertions that Microsoft was illegally foisting an inefficient operating standard upon hapless computer users. In support of these assertions, economists have looked to an area of economic research known generally as the "economics of QWERTY"—a body of literature provoked by Paul David's 1985 article in which he suggested that the standard QWERTY typewriter keyboard is an unfortunate accident of history that might have been avoided by enlightened government policy concerning the establishment of standards. David's assertions and his historical account have been vigorously criticized by Stan Liebowitz and Stephen Margolis in a series of articles over the past two decades and in a recent book (Liebowitz and Margolis 1999; see also their essays in Lewin 2002). The essence of the question is summarized in table 2, which is an application of table 1.

As before, assume that in order to establish policy relevance it is necessary to disprove the null hypothesis. The alternative designs again reflect the experimenter's presumptions. Design B places the burden on those who suspect that QWERTY is an inferior standard and lean in favor of policy interventions, whereas Design A places the burden on those who presumptively oppose such intervention.

12. I do not claim here that the recognition of the connection between methodology and values is an original insight. It is obviously well known that Type I–Type II issues influence the results obtained from any inquiry and therefore the action to which such an inquiry may lead (for example, see Blaug 1992, 21–22). Nagle (1961) distinguishes between *characterizing* and *appraising* value judgments. The former refers to methodological decisions (how to gather data, how to structure the burden of proof, and so on), whereas the latter refers to value judgments as normally understood, or as derived from one's conception of the "good society." What is perhaps new in my article is the identification of an important connection between these two types of judgment: one's conception of the "good society" influences how one structures one's inquiries (and specifically where one places the burden of proof) and therefore what policies are eventually adopted. The practical importance of this issue is huge. It is another aspect of what Thomas Sowell (1987) has called the "conflict of visions" in noting how one's unstated presumptions about how to achieve the "good society" influence the kinds of policies one is prepared to recommend in pursuit of that "good society." When these presumptions come packaged in unstated methodological practices, however, the connection is much less obvious.

13. **Editor's note:** For an excellent economic analysis, see McKenzie and Shughart 1998.

Table 2
Experimental Design for Judging Qwerty

Experimental Design	H_0 = the null hypothesis	H_1 = the alternative hypothesis
Design A	QWERTY is inefficient.	QWERTY is efficient.
Design B	QWERTY is efficient.	QWERTY is inefficient.

The Burden of Proof Is the Dividing Line

Liebowitz and Margolis, on the one side, and David, on the other, appear to agree on what it means for a technology to be inefficient; they agree that the criteria must involve an appeal to individual consumer valuations. For example, David has written: “By [an inefficiency] we must mean that an alternative outcome would be preferred in some collective sense (perhaps by application of a compensation test) to the one [individuals] are now in, and that they also (collectively) be ready to incur some substantial costs to rectify the situation—assuming it was feasible to do so” (1997, 13).

How then are such situations identified and corrected? David is convinced that in certain historical situations, individuals were “bounded by a parochial and myopic conception of the process in which they were engaging . . . [and in which they] failed entirely to foresee the complementary innovations and investments that would be influenced by their initial commitment to one rather than another course of action” (1997, 15). Moreover, according to him:

One thing that public policy could do is to try to delay the market from committing to the future inextricably, before *enough* information has been obtained about the likely technical or organizational and legal implications of an early, precedent-setting decision. . . . [P]reserving open options for a longer period than impatient market agents would wish is a generic wisdom that history has to offer to public policy-makers, in all its application areas where positive feedback processes [such as network effects] are likely to be preponderant over negative feedbacks. Numerous dynamic strategies can and have been suggested as ways of implementing this approach in various specific contexts where public sector action is *readily feasible*. Still more sensible and practical approaches will be found if economists *cease their exclusive obsession with traditional questions of static welfare analysis* and instead of pronouncing on the issue of where state-intervention would

be justified in the economy, start to ask what kind of public policy actions would be most appropriate to take at different points in the evolution of a given market process. (1997, 16, emphasis added)

David seems to be suggesting here that policymakers have information about what future information (or type of information) will yet be revealed and knowledge of when enough information has been revealed to allow competition between standards to proceed without regulation. In this view, the policymakers somehow know more about what can and will be known than economic agents do. David might object, however, that even if market agents had the same knowledge about future knowledge that policymakers have, they are not organized to provide or interested in providing a collectively rational solution.

Nevertheless, the knowledge problem is the crux, and it is implicit in Liebowitz and Margolis's arguments, as I show momentarily. It is ironic, therefore, to find David in this passage and in numerous other places criticizing economists such as Liebowitz and Margolis for their preoccupation with static welfare criteria. He also seems to be suggesting that moving beyond such a framework would support the type of policy activism he is proposing.

The static welfare framework is indeed problematic, as indicated earlier, and one may readily join David's call for moving the education of economists beyond it. For truly dynamic processes, the traditional types of efficiency assessments, which rest on static models of resource allocation, are inapplicable. So much may be agreed by both sides of this debate; David's formulations notwithstanding, this issue does not appear to be the dividing line between the disputants. Rather, Liebowitz and Margolis are implicitly suggesting a different placement of the burden of proof. They are not suggesting that the QWERTY standard that David has pronounced inefficient has been conclusively shown to be efficient. Rather, they are saying that the claim that QWERTY is an inferior standard and that a more efficient standard might have been adopted with judicious government help has not been proved and cannot be proved, and, by implication, they are arguing that we should not adopt the kind of experimental design that easily allows such a "proof." The problems both of value intrusion in the concept of efficiency and of the placement of the burden of proof play a role in this example.

Monopoly in a Dynamic World: Static Efficiency Criteria are Inadequate

With an eye to QWERTY-type effects in the case of Microsoft, Liebowitz and Margolis argue that network effects are seldom if ever an effective mechanism for isolating firms from competition and that the kind of criteria by which we should judge the presence or absence of monopoly should not be the usual market-share criteria. As they point out, "[I]n this [real] world, the firm competes not to take its share of

today's market; it competes to take the market for its share of days. Legislators and courts may choose to make some ways of competing legal and some not, but the old structuralism approaches to antitrust will only be misleading"(1999, 13). The old notion of competition as a state of affairs needs to be replaced by a notion of competition as a process over time in which some firms displace others, with an individual firm sometimes becoming the dominant or only firm in an industry in a certain period. According to Liebowitz and Margolis, competition may indeed show up as "serial monopoly. [It] here takes a very different form from that found in text book models of perfect competition. . . . There really is no 'competing' by firms in models of perfect competition, except to keep costs down" (63–64). We should not base policy "on a worldview that is taken a bit too literally from an intermediate microeconomics textbook. In the real world, information is not perfect; the future is not known with certainty; products are not perfectly homogeneous; and sometimes what we like is influenced by what others like. . . . From the perspective offered by . . . the textbook model of the ideal economy, we might well be confused by strategic alliances, by technology-sharing agreements, by long-term guarantees, or by the continuous addition of functionality to a product." Liebowitz and Margolis reject the claims "that winners might more appropriately be chosen by policymakers than by people making choices in a free market" (243–44).

Placing the Burden of Proof Again: Which Type of Policy?

"Although our theoretical discussion does not prove that markets must always choose the best technology," Liebowitz and Margolis write, "we do claim that there are good reasons to expect it to be very unusual for market participants knowingly to choose the wrong technology" (1999, 117). Therefore, they require that a heavy burden of proof be borne. "[P]roofs of existence of inefficiency can never rely on the mechanics of production and consumption alone. . . . [M]arket failure ought to be a very specific and very worldly claim. *Policy-makers shouldn't go about correcting markets until they have concrete proof that markets have failed*"(239–40, emphasis added).

David places the burden in a different place in his response to a challenge (from Deidre McCloskey) to demonstrate that an "economically significant" inefficiency exists. In the course of his argument, he asserts that "*the burden of proof plainly falls on those who say that everything has turned out for the best*" (1999, 8, emphasis added). He asks, "Why isn't it up to the skeptics to demonstrate empirically that [departures from some theoretical optimum] only matter 'a little'? Where is it written that the burden of showing quantitative importance in this matter belongs only on the shoulders of those who keep finding grounds (in both reason and fact) for disputing the presumption of optimality or near optimality?" (5).

The answer to David's questions is surely, as explained earlier, that optimality is *not* assumed (at least not by Liebowitz and Margolis). It is not even considered. David's critics focus instead on the likelihood that interventionist government policy

can improve matters in a world of rapid change and innovation. They argue that because such intervention is coercive by its very nature, the presumption ought to be against it.

Conclusion: We Ought to Come Clean

Although the foregoing example is a good illustration, it is only an illustration of the tight connection between facts and values in economic discussion and, more important, in economic practice. In the context of policy prescriptions, one cannot simply appeal to the historical-empirical record. The facts are complex, and any judgment must take into account the necessity of constructing counterfactuals that represent a dynamic world. More important and much less obvious, one also has the prior task of deciding how to structure the interpretation of such policy-relevant facts, remaining ever cognizant of the policy's inevitable embeddedness in a sociohistorical context. In making an interpretative-experimental design choice, one cannot avoid taking into account the consequences of that choice and the *evaluation* of those consequences according to one's fundamental or instrumental values. To deny this claim is to maintain an illusion. To recognize it and to make one's position clear are ingredients of good scholarship.

As long as research uses sample data to make inferences (which can hardly be avoided), the problem of interpretation cannot be avoided, regardless of the particular statistical method or even methodology we use. In everything we do, we are forced to make decisions based on assumptions formed in part from our experiences with the behavior of others, which in turn reflect only part of the whole picture. These assumptions reflect conscious or unconscious values (such as giving people the benefit of the doubt, presuming the innocence of an accused person, etc.). This reality does not entail that we cannot strive for scientific detachment once these fundamental preconditions have been set and the research proceeds. *Within* the particular "research design," we may still strive for and insist upon scientific detachment, even though our values have necessarily influenced the design itself.

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