Judicial Review of Economic Analyses

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Most federal appellate judges are generalists, not intensively schooled in economic theory and mindful of the limits to their institutional competence.¹ Judicial review of economic analyses is an increasingly important task of the courts, however, particularly courts like the United States Court of Appeals for the District of Columbia Circuit that hear appeals from the rules and rulings of regulatory agencies.² Agencies use economic analyses for administrative decision-making in a variety of ways. They may be required by statute to make decisions that are “economically feasible”³ or to consider “reasonableness of cost.”⁴ Even when the governing statute says nothing specific about economic principles, the agency may rely heavily on economic analysis to meet more general statutory criteria, such as determining that rates are “just and reasonable.”⁵ In such cases,
the agency often uses economic theory to predict the consequences of a particular action and to determine whether that action is in accord with the statutory mandate.\(^6\) In still other cases, the agency may use economic analysis simply to find jurisdictional facts.\(^7\)

Notwithstanding the differences among these situations, they all require judges to understand the often arcane economic issues involved in an agency's decision. Recently, for example, the D.C. Circuit decided whether the Interstate Commerce Commission's (ICC) automatic cost index for incorporating cost increases into railroad rates must be adjusted to reflect increased productivity,\(^8\) whether the Federal Energy Regulatory Commission (FERC) can require a utility purchasing power from a cogeneration facility to pay a rate equal to the utility's "full avoided cost,"\(^9\) and a host of similarly esoteric disputes.\(^10\) To say that these eco-

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7. See, e.g., Staggers Rail Act of 1980, Pub. L. No. 96-448, 95 Stat. 1895 (to be codified in scattered sections of 41, 45 & 49 U.S.C.) (ICC has jurisdiction to review reasonableness of rates charged by "market dominant" railroads, with market dominance in a particular market determined by ratio of rates to variable costs); 1 P. AREEDA & D. TURNER, ANTITRUST LAW § 231, at 227 (1981) (definitions of "interstate commerce" under the federal antitrust statutes).

8. Western Coal Traffic League v. United States, 677 F.2d 915 (D.C. Cir.). cert. denied, 103 S. Ct. 568 (1982). The issue in Western Coal was whether the ICC's cost index reflected only inflationary costs and was thus unreviewable under the Staggers Act. Petitioners argued that an appropriate inflation index should account only for actual increases in cost per unit of output, and that the ICC's chosen "market basket" index would allow railroads to receive unreviewable, profit-enhancing rate increases whenever railroad productivity increased. On review, we concluded that the statute did not prescribe a particular methodology for calculating the index, but did provide guidance as to what factors the Commission could properly consider in selecting an index. Increasing railroad profits, we concluded, was not a proper reason for choosing a market basket methodology. Nonetheless, we concluded that the Commission had provided a sufficient pragmatic rationale for selecting the simpler market basket methodology in its initial rule. We noted that the record failed to offer a workable alternative that would serve the statutory purpose of allowing railroads to recover inflationary cost increases quickly.

The critical problem in Western Coal was that petitioners offered a well-schooled economic argument but did not adequately rebut the ICC's assessment of the impracticality of putting their theory into practice. Thus, while we agreed with petitioners that the inflation index was not designed to enhance profits, and that the market basket index might have that effect, we could not provide them with the relief they sought.


10. E.g., Consolidated Edison Co. v. FERC, 676 F.2d 763 (D.C. Cir. 1982) (claim for monetary compensation by natural gas distribution companies with fewer high priority customers than their competitors, because regulation curtailed gas supplies during shortages according to customer priorities); Illinois Cities of Bethany v. FERC, 670 F.2d 187 (D.C. Cir. 1981) (challenge by municipal
econic issues are complex, and pose delicate problems concerning the proper scope of judicial review, is to understate the challenges that they present. Nor are such adjudications just a passing trend. Indeed, judging from the pending bills on regulatory reform, it seems likely that the economic issues confronting the courts will become even more delicate and intricate in future years.11

This article briefly reviews the problems that can impede adequate judicial review of economic decisionmaking by administrative agencies and then provides some suggestions for appellate judges about how to approach these mixed issues of law and economics. These suggestions are aimed at judges, but they may be profitable for litigants and agencies as well, because they indicate the limitations as well as the strengths of economic analyses in the appellate courts.

I. Impediments to Review

Under the Administrative Procedure Act (APA), agency actions are evaluated on such catch-all grounds as whether they are based on "substantial evidence" or are "arbitrary and capricious," an "abuse of discretion," or "otherwise not in accordance with law."12 These legal standards are terms of art that leave enormous room for judicial examination of the substantive as well as the procedural aspects of agency decisionmaking. At the same time, as the Supreme Court frequently reminds us, the reviewing court must not substitute its policy choices for those of the agency to which Congress has entrusted implementation of its laws.13 Judges must neither usurp the prerogatives of the other two branches nor neglect their own office, but the line between "rubber-stamping" and "second-guessing" often seems to be thin indeed.

Applying the strictures of the APA or of agency-specific statutes such as utilities to FERC ratemaking that allegedly subjected municipalities to prohibited "price squeeze"; the utilities claimed that they could not purchase wholesale power at rates charged by regulated suppliers and still compete with the suppliers for retail customers; Sierra Club v. Costle, 657 F.2d 298 (D.C. Cir. 1981) (validity of EPA emission limits for coal-fired power plants).

11. Recently proposed "regulatory reform" bills would require that agencies engage in cost-benefit analysis for all "major" rules and regulations. See S. REP. No. 305, 97th Cong., 1st Sess. (1981); H.R. REP. No. 435, 97th Cong., 2d Sess. (1982). With certain exceptions, agencies must show that the "benefits" of the proposed rule justify the "costs" and that the rules adopted are the most cost-effective alternatives for achieving the objective of the rules. These proposals are discussed in part IV infra.


13. See, e.g., Phelps Dodge Corp. v. NLRB, 313 U.S. 177, 194 (1941) (courts must "guard against the danger of sliding unconsciously from the narrow confines of law into the more spacious domain of policy"); cf. Vermont Yankee Nuclear Power Corp. v. Natural Resources Defense Council, 435 U.S. 519, 549 (1978) (court should "not stray beyond the judicial province to explore the procedural format or to impose upon the agency its own notion of which procedures are 'best' or more likely to further some vague, undefined public good").
the Clean Air Act\textsuperscript{14} to administrative cases involving economic decision-making is therefore intellectually challenging in itself. Under any formula of judicial review, the process of adjudication adds further impediments. To start with, appellate courts are docket-ridden. The D.C. Circuit decides over 600 merits appeals each term, along with more than 600 motions, and the time that a judge and his or her law clerks can devote to any one case is limited. Briefs are confined by court rule to a finite number of pages, regardless of subject matter, and oral arguments are often truncated (15 minutes per side is the norm). As a result, the period for learning new terms and grasping new concepts is short.

Time constraints aside, appellate courts are also limited by the manner in which the cases are presented. Department of Justice and agency lawyers may justifiably fear that courts will not understand the economic analysis in a particular case, but it is also a fact that these same lawyers often fail to present such analysis coherently.\textsuperscript{15} The appellate judge, unlike the district judge or the agency's administrative law judge, never gets to talk directly to the economists, question the experts, or ensure that every piece of relevant information finds its way into the record. Instead, appellate judges have their economics filtered through both the factfinders below and the lawyer-advocates that argue the case in court. Because the case is argued by lawyers, the economic analysis is thrust into lawyers' language and lawyers' principles and perceptions even when the fit is not smooth. It is not so uncommon for an appellate panel to miss a key element in a particular case or to misunderstand the nature of the regulated transaction, with unhappy or even disastrous results. Ironically, by the time such judicial misunderstandings surface in petitions for rehearing, the litigants themselves have often changed lawyers or brought in additional counsel.\textsuperscript{16}

Finally, once the briefing and oral argument are over, the judge is cut

15. One commentator has stated:

[The uncertainty and lack of reality of economic analysis] frustrates lawyers, who are forced to deal with actual problems in all their complexity, however poor the information, and who find it hard to understand people who would rather work out pure models than analyze untidy reality. This frustration leads lawyers into a profound error. Not really understanding that economic analysis is an approach to problems of which rigorous analysis is only the paradigm, and not really wanting to learn a new set of concepts, lawyers are easily persuaded that because economics provides few firm answers to problems they are free to ignore it entirely.

DeLong, supra note 1, at 329-30.
16. Without citing cases, I confess that this has happened to me on a few occasions. The explanation of the attorneys is often better the second time around, perhaps because they can see from the court's opinion what was or was not understood initially. One of the great virtues of the rule permitting petitions for rehearing, FED. R. APP. P. 40, is that it encourages this sort of "reasoned dialogue" between the parties and the court. See generally Fiss, The Supreme Court, 1978 Term—Foreword: The Forms of Justice, 93 HARV. L. REV. 1, 12-13 (1979).
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off from further contact with the authors or interpreters of the relevant economic analysis, no matter how complex or disputed the case.  

He or she must rely on the written record, the insights of other members of the panel and of law clerks, and whatever available treatises or articles seem useful. In this endeavor the pitfalls awaiting a judge may occasionally approach those encountered by the inexperienced prisoner writing a pro se petition, liberally sprinkling it with fine-sounding quotations from ancient decisions that may have no relevance to the case at hand. The judge’s situation may in one respect be even worse, because if the prisoner has a discernible case, the court may appoint counsel to provide legal fortification; no such help is in sight for the non-economist judge. There are, of course, annual solicitations of judges to attend economic seminars that are financed by university or corporate grants and that feature lecturers and texts chosen by the sponsors. But many judges have no time or inclination to attend these, and self-help attempts to become an instant expert in the Chicago or MIT schools of economics run the risk of compounding ignorance rather than defeating it. Most judges cannot be expected to become proficient in the mathematical equations of quantitative economics any more than they can be expected to master the blueprints of complex technological mechanisms or the software programs for computers. To what level of understanding should the judge aspire? How then should judges governed by the limits of their skill and office approach the task of deciding cases that involve complex economic analyses?

II. Initial Suggestions to Judges for Dealing With Economic Analyses

I find the most useful thing a judge can do initially in any case in which economic analyses figure prominently is to focus on the specific transactions or institutions that have been regulated. Tackling the specialized economic theories and ratemaking formulas is best postponed until the basic facts and the basic microeconomics have been grasped. How does a gas curtailment system actually work at the pipeline or distribution level? What makes up a market basket cost index, and how frequently is it revised? How are consolidated income taxes calculated? These funda-

17. I have lamented elsewhere this aspect of appellate process. See Wald, Making “Informed” Decisions on the District of Columbia Circuit, 50 GEO. WASH. L. REV. 135, 153 (1982) (“[J]udges often do not discover difficulties with complex technical aspects of the case . . . until after oral argument, when they settle down to prepare an opinion,” and therefore “the judges should be able to call the parties back in, along with their experts.”).

18. The law clerks have more recently completed their formal education, and are often beneficiaries of the recent emphasis on economic analysis of legal problems that has become a staple of American law schools. See, e.g., R. POSNER, ECONOMIC ANALYSIS OF LAW (2d ed. 1977); G. CALABRESI, THE COSTS OF ACCIDENTS (1970). Many judges now look for economic as well as legal proficiency when they hire law clerks.
mental understandings are the sine qua non for deciding whether an agency decision is reasonable or not. In my experience, most misguided judicial decisions go wrong at this basic level. It is not hard to see why, for the agency and the litigants are wont to gloss over the basic transaction or relationships and to emphasize instead whatever economic or legal litany is currently in vogue: rules of reason, per se violations, predatory pricing, subsidized competition, prohibited price squeezes, market ordering, and so on. Going behind the conclusory language and the economic as well as the legal labels is a necessary first step to finding out what the case is really about. This often requires tedious digging into the record, but if a judge does not do that digging, he or she runs the risk of becoming prematurely enmeshed in debates over arcane points of economic analysis, eventually overwhelmed, and tempted mightily to retreat to the reductio ad absurdum of agency deference, to wit, "if it is too complicated for me to understand, the agency must be right."

The judge should approach each case involving an economic analysis by asking, "What has to be true for this policy to make sense?" He or she then looks to see if those facts or conditions are accounted for in the analysis and, where appropriate, if their existence is documented in the record. To the extent that oral argument allows, the judge should ask enough questions, no matter how basic, to ensure that he or she has grasped the transactional roots of the controversy. When pressed, however, the lawyers themselves will often be unsure about how the process or events being regulated are carried on, and the court may need a supplemental briefing. Though not always satisfactory, it seldom hurts, and may help the parties focus on and clarify areas of factual confusion.

Judges should also be prepared, however, for a few unfortunate times when arguments are a total shambles insofar as the clarification of underlying complex issues and data is concerned. Agency lawyers are prone in such situations to assure the court that the expertise lies in the agency. Challengers too may prefer to obfuscate the weaknesses of their cases by discoursing at length on the global messages of prior holdings and by passing too swiftly over the unique facts of the present controversy. Those are the cases most likely to result in erroneous or misguided holdings, unless (or sometimes even if) the judge undertakes a colossal self-education effort.

19. In one recent maritime rate case, the government's brief argued only that the agency's rate decision should receive deference, and gave no hint of the reasons why the rate might be reasonable. We had to refer to the briefs filed in the district court to find any semblance of any explanation, and that explanation proved to be inconsistent with the agency's own explanation. Aeron Marine Shipping Co. v. United States, 695 F.2d 567, 581-82 & n.44 (D.C. Cir. 1982).
III. Particular Problems in Judicial Review of Economic Analyses

A. Degree of Deference

In any particular case it is necessary to identify the nature and function of economic analysis in the relevant statutory scheme. The various statutory roles that economic analyses can play have implications for the appropriate level of judicial scrutiny.

1. Economic Facts

Some statutes require findings of particular economic facts as a basis for agency jurisdiction to regulate in a particular manner, i.e., a railroad's "market dominance" or a transaction's effect on "interstate commerce." Such findings must be made by the agency or district court on the basis of expert, and often conflicting, testimony. Here the appellate court must be scrupulous in assuring itself that the evidence supports the factual finding since Congress did not mean the agency to have regulatory authority at all in the absence of such a finding. The economic expert whose views are given the greatest credence below, in this as in other disputed areas, will usually be a staff witness. Although administrative law judges, agencies, and trial courts have discretion to assess the credibility and persuasiveness of a staff expert, an appellate court must conduct a careful review to ensure that substantial evidence in the record supports the jurisdictional finding. One cannot totally ignore the circumstance that agency members are advocates of their own long-run policies as well as adjudicators; even administrative law judges are assigned for long periods of time to single agencies. In the main, it seems fair to conclude that when the statute requires that a particular fact be found, appellate courts may have a greater responsibility to scrutinize the record for "substantial evidence" than they do when Congress has expressly entrusted to the agency judgments about what is "economically feasible" or "just and reasonable."

20. See supra note 7.
22. Cf. Ethyl Corp. v. EPA, 541 F.2d 1, 20-24 (D.C. Cir.) (en banc) (EPA does not need to make specific findings of harm to health before regulating lead in gasoline), cert. denied, 426 U.S. 941 (1976). See generally K. DAVIS, ADMINISTRATIVE LAW TEXT § 15.03, at 296 (3d ed. 1972) (practical difference between adjudicative and legislative facts is that agency's "findings of adjudicative facts must be supported by evidence, but findings or assumptions of legislative facts need not be, frequently are not, and sometimes cannot be supported by evidence"). But see Davis, Facts in Lawmaking, 80 COLUM. L. REV. 931, 932 (1980) (observing trend toward requiring agencies to develop facts even for legislative rulemaking, and recognizing that issue "is difficult because legislative facts come in so many
2. Economic Analysis Required by Statute

Where a governing statute requires the agency to conduct an economic analysis as a basis for action, the reviewing court’s responsibility is two-pronged, and the degree of deference accorded the agency varies between the prongs. Since the analysis is a statutory prerequisite to agency action, the court must insist that it be done and that it include whatever components Congress specified. Little or no deference is due the agency in such threshold scrutiny. On the other hand, Congress has also decreed that it is the agency, not the court, that is to perform the analysis, and the courts must give a high degree of deference to the way the agency does it, so long as no statutory components or directives are violated.

It is easier to state this dichotomy than to apply it, however, because the court’s frame of reference is always the statute by which the agency is governed. If the statute requires the agency to make decisions that are “economically feasible,” for example, then a decision on feasibility is an unavoidable component of judicial review. The court must assure itself that the statutorily mandated decision about economic feasibility has been made and that the agency’s reasoning was rational and supported by evidence. An agency cannot immunize arbitrary or capricious substantive decisions by dressing them up in the Emperor’s clothes of economic jargon. The court must also be cautious that the economic analysis takes account of the factors that Congress intended to be considered, insofar as Congress has made its intent clear.

In looking at such factors, the court

23. Even under the “limited” review of regulatory analyses envisioned in pending regulatory analysis bills, see infra text accompanying notes 50-60, if an agency failed to do the analysis at all, the rule “should in almost all cases be set aside for a failure to comply with statutory mandates.” S. REP. NO. 305, supra note 11, at 60; see 128 CONG. REC. S2390 (daily ed. March 18, 1982) (statement of Sen. Laxalt).

24. Thus, economic feasibility can mean reasonable compliance cost to each individual company or only to a class of companies, or survival of the industry, depending on the statute or even the particular section in the statute. Dolgin and Guilbert have discussed the various kinds of cost analyses contemplated by different sections of the Federal Water Pollution Control Act, 33 U.S.C. §§ 1251-1376 (1976):

In short, the 1977 “best practicable” standard must be set in light of some type of cost-benefit analysis while the 1983 “best available” level and the new source level must consider cost in some unspecified other manner. The legislative history of the 1972 Amendments indicates that the failure of the statute to be more specific on how cost is to be considered for the 1983 and new source levels was probably due to disagreement among the conferees. This disagreement shows up in conflicting statements by the House and Senate managers during the floor debates on the Conference Report on the 1972 Amendments.

On the House side, the conferees stated that cost-benefit analysis was required even as to new source standards, the only difference being that for the 1977 “best practicable” standard “total costs,” including “external costs” such as “potential unemployment, dislocation, and rural area economic development,” must be considered, while for the new source standards only “internal cost,” i.e., “the cost of equipment,” need be considered.

On the Senate side, however, the conferees’ statement indicated that for new source effluent
is construing the statute, and although agency interpretation has a role to play in such constructions, the level of deference is not as high as that to be accorded to the agency's choice of theories and methodologies for conducting the analysis.

3. **Economic Analysis Not Required By Statute**

In situations where Congress has not specifically told the agency to assess cost or other economic impacts, it may nonetheless rely on such analysis as evidence to support more general policies. Here, courts may have a lesser obligation to defer to the agency's analysis since it is being submitted in lieu of other, more traditional evidence, and not at the direction of Congress.

**B. Agency Choice of Economic Theory**

Often, the agency and the opposing litigants will rely on competing economic theories. Courts should be careful not to conduct their reviews on the basis of the comparative worth of different schools of economics. Presumably, unless Congress has indicated otherwise, the agency may determine to which theory it wishes to give credence. Thus, an agency decision to fix rates on the basis of fully allocated costs rather than marginal costs should ordinarily go unchecked. That choice goes with the political territory.

On the other hand, whatever their differences over the soundness of particular policies, economists substantially agree on certain fundamentals standards a "reasonable cost test" was intended, under which any available technology might be required so long as the cost does not seem too high. Indeed, the Senate conferees made it clear on the Senate floor that they had agreed only reluctantly to cost-benefit analysis for the 1977 standards, and they attempted in their floor statement to limit such analysis to a determination as to whether the benefits of the standards are "wholly out of proportion" to the costs of achieving it. The Senate conferees went on to state that with reference to the 1983 "best available" standard: "While cost should be a factor in the Administrator's judgment, no balancing test will be required."

This is one of the many situations in the legislative history of the 1972 Amendments where the Senate and House managers made statements in the floor debates which they apparently could not agree on at the conference.


of microeconomic theory: In the long run, supply must equal demand; in a competitive market, an efficient operator will earn a reasonable return on invested capital but no more; investors will seek to maximize profits; and so on. If, after the careful factual inquiry advocated in part II, a judge determines that the agency’s analysis is inconsistent with basic microeconomics and that the agency has not explained (perhaps because it has not noticed) the discrepancy, the judge may properly conclude that the agency action as arbitrary and capricious. This is not to say that an agency cannot reject the prevailing economic wisdom, but courts can properly insist that the agency do so consciously and explain why it chose to rely on an unorthodox theory.

C. "Hard Look" Review of the Record

Under present law, a reviewing court must determine whether an agency finding of, say, economic feasibility is supported by "substantial evidence," i.e., enough economic data for the judgment of feasibility to be reasonable. Although in this area a court should probably accord a high degree of deference to the agency’s presumed expertise, courts still have a statutory responsibility themselves to determine how much economic data and supporting analysis—and what sorts—constitute "substantial evidence."

1. Computer Modeling

In several recent cases, agencies have offered as "substantial evidence" the results of complicated models that use massive amounts of data about seemingly innumerable variables to predict what will happen under different policy options. We can anticipate that the "proof" of economic judgments will increasingly be served up in terms of these computer simulations, regression analyses, and other data-based predictions of future consequences rather than descriptions or analyses of past events. Of course, since such models and simulations inevitably incorporate economic theories of behavior, the court is really being asked to accept those theories as well as the predicted results that follow from them as the "substantial evidence" necessary to backstop agency choices.

28. See, e.g., Aeron Marine Shipping Co. v. United States, 695 F.2d 567, 578-81 (D.C. Cir. 1982) (agency assumed that U.S. ships would be reasonably profitable despite their high fuel costs).
29. See Columbia LNG Corp. v. FPC, 491 F.2d 651 (5th Cir. 1973) (rule invalidated for lack of substantial evidence as to incremental pricing requirement); compare Vermont Yankee II, 685 F.2d at 490-94 (NRC applied proper standard of economic feasibility and cost estimates were correct) with id. at 516 (Edwards, J., dissenting) (NRC’s estimate of construction costs for nuclear reactor was arbitrary and capricious, as based on untenable assumption of indefinite public subsidy).
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The earlier discussion of deference to agency policy choices would then apply. However, because the economic theory is buried in the computer model rather than being explicit in the agency's explanation for its decision, the potential for overlooking instances where the agency has failed to justify its key assumptions is enhanced, and the need for judges to ferret out the underlying facts and circumstances is especially acute. The degree to which courts can successfully address themselves to these models may well be a hallmark of the efficacy and utility of future judicial review of economic analyses.

Thus far, attempts by outside parties to challenge this futuristic approach by agency decisionmakers have not fared particularly well. The environmental plaintiffs in Sierra Club v. Costle, for example, argued that an EPA-constructed econometric model forecasting power plant emissions under alternative sulfur dioxide emission standards generated results so "speculative" and "unreliable" that they could not qualify as substantial evidence. The model was designed in aid of EPA's duty under section 111(a)(1)(C) of the Clean Air Act to consider cost, energy, and health and environmental factors in addition to air quality in determining the percentage reduction in sulfur dioxide emissions achievable by the best technological system of emission reduction. The model assessed total air emissions, utility investment in new plant and pollution equipment, consumer costs, energy production and consumption, coal use, utility consumption of oil and natural gas, and the amount of western low-sulfur coal shipped East.

The environmental plaintiffs challenged the model's focus on long-term rather than short-term outcomes under various assumptions and on national and regional emissions rather than individual plant emissions. But most important, they attacked its "cost-minimization" assumption, which became the linchpin of EPA's rationale for the standard it adopted, i.e., that at a certain point, the higher cost of more restrictive emission requirements for new power plants would retard rather than promote air quality improvement because they would delay the retirement of older, poorly controlled plants and their replacement by newer and cleaner ones.

The court in Sierra Club reviewed, for "internal consistency and reasonableness," the assumptions underlying the proposed rule and EPA's explanation for them, the methodology used in constructing the model, and the agency's public responses to public comments received on the assumptions. It concluded that "EPA's reliance on its model did not exceed the bounds of its usefulness and that its conduct of the modeling exercise

was proper in all respects."31

In all candor, courts must be exceedingly careful that judicial review of the type of sophisticated modeling involved in Sierra Club does not turn into a rubber-stamping of the outcome chosen by the agency. Inevitably, those who control the computer program and input have substantial capacity to manipulate the result.32 Courts start with a presumption in favor of the agency.33 The addition of advanced economic modeling techniques built on the economic theories selected by the agency gives the agency a decided edge on review that appellate courts and challengers are hard put to override.34 Judges can easily become overwhelmed by the sheer number of assumptions embedded in an economic model, the complexity of their interrelationships, the possibility that some of the assumptions can be expressed or even understood only in quantitative terms, and the relationships among the assumptions, the data fed into the model, and the results emanating from the model. The task of review—at any level—can be a daunting one indeed.

Yet, it seems inevitable to me that judges must review as evidence the results generated by computers and econometric models—even if they occasionally lose their way in equations, computer runs, and software programming. A reviewing court can and must still examine the results of the agency's simulation in order to ensure that the agency's conclusion actually flows from the computer's result. That final connection requires primarily logic and legal skill, both of which are familiar home turf for judges.

A court must also look at the assumptions on which the model is based, even if it does so deferentially because the assumptions are inextricably tied to a particular economic theory. It can demand that the agency justify its assumptions, although it cannot reject them simply because they are controverted. At base, even the most intricate computerized economic

31. 657 F.2d at 334. But see B. ACKERMAN & W. HASSLER, CLEAN COAL/DIRTY AIR 81-103 (1981) (criticism of EPA cost-benefit analysis for “defin[ing] its mission in an extraordinarily narrow way” in terms of environmental hazards, id. at 81, failing to recognize different required interests at stake, examining too limited a range of policy alternatives, reflecting an unrealistic view of enforcement, and using “a computer analysis rich in its discussion of costs but impoverished in its consideration of the benefits that putatively justified all the activity.” Id. at 84.).

32. If there is one thing that generalists comprehend about the Computer Age, it is the acronym “GIGO”—garbage in, garbage out. In Sierra Club v. Costle, 657 F.2d 298, 334 (D.C. Cir. 1981), however, we took reassurance from the fact that EPA too recognized the sensitivity of its model to “a few key initial assumptions,” and thus displayed “consciousness of the limits of its model.”

33. See, e.g., Citizens to Preserve Overton Park, Inc. v. Volpe, 401 U.S. 402, 415 (1971) (“Certainly, the Secretary’s decision is entitled to a presumption of regularity.”); Sierra Club v. Costle, 657 F.2d at 334 (“EPA has the benefit of the presumption of good faith and regularity in agency action.”).

model is a series of steps in logic; a court can insist that the model’s assumptions be converted, to the best of the agency’s ability, from impenetrable mathematics to sentences in English. While no substitute for a Ph.D. in theoretical economics, such exercises can reveal, in a surprising number of cases, gross errors—or assumptions in the model that, while acceptable under a particular school of economics, contradict specific indicia of congressional intent with regard to the particular statute. Furthermore, the court can ask the agency for expert guidance as to the relationship between the assumptions in the model and the raw data that fueled it; critical gaps may be revealed in the agency’s responses.

The aim is to demystify modeling; to demand that the agency make the model’s assumptions and workings understandable to a reviewing judge who has the statutory duty of deciding if the model’s predictions rise to the level of “substantial evidence.” This may take more time at oral argument or more pages in the brief, but it is essential to the utility of judicial review in a high-tech era. The alternatives are unpalatable: Either review will be perfunctory or administrative agency decisions involving economic modeling will have to be sent to a specialized court.

35. It is well recognized in statistical analysis that a model is only so good as the theory underlying the model. See Fisher, Multiple Regression in Legal Proceedings, 80 COLUM. L. REV. 702, 713-15 (1980). Thus, an appellate court’s first step in reviewing an economic model is to assess whether it makes any sense. For example, has the agency provided some reason to believe that certain variables are dependent on other variables? A properly developed trial or rulemaking record may also help a reviewing court locate weaknesses in a model that are not so readily apparent. For instance, the trial record may demonstrate that the agency cast about for a statistical model by trying a range of equations without first searching for an appropriate theory. In such cases, a “good fit” between the model and the data may simply be a “spurious” result. Id. Inquisitive trial or agency lawyers may also assist reviewing courts by finding out what sort of analysis the agency did of the sensitivity of its model to variations in the assumptions. Sensitivity analysis can indicate how reliable the model is, and therefore to what extent the agency may properly rely on the model. See B. ACKERMAN & W. HASSLER, supra note 31, at 82 (discussing narrow sensitivity analysis conducted by modelers at EPA).

36. See, e.g., Puerto Rico Maritime Shipping Auth. v. Federal Maritime Comm’n, 678 F.2d 327, 342-44 (D.C. Cir. 1982) (agency’s economist calculated cost of servicing long-term debt at seven percent during period of double-digit interest rates); San Antonio v. United States, 631 F.2d 831, 852 (D.C. Cir. 1980) (seven percent additive above full costs set aside because figure used with no supporting rationale or justification).

37. See, e.g., International Harvester Co. v. Ruckelshaus, 478 F.2d 615, 648-49 (D.C. Cir. 1973); B. ACKERMAN & W. HASSLER, supra note 31, at 105 (for “agency forcing statutes,” courts should require the fullest possible agency investigation into competing policy approaches).

It should also be noted that the short-run economic costs or consequences of a particular policy may be quite different from the long-run consequences, and that an analysis focused on one rather than the other may produce quite different results. See, e.g., B. ACKERMAN & W. HASSLER, supra note 31, at 66-74 (criticizing EPA’s sulfur dioxide regulations requiring “forced scrubbing” as failing to minimize either short- or long-term costs since they ignore less expensive means of reducing emissions in the short run and commit billions of dollars before potentially less costly long-term responses have been researched and evaluated).
2. **Validating Economic Predictions**

Most economic analyses are designed to make predictions about the future; thus, there is no direct way to test their validity. But once a regulatory scheme has been in place for a few years, one can often evaluate it and determine whether the earlier predictions were borne out. If the agency then wants to rely on the same economic predictions in a similar situation, a court may be able to insist that the agency first inquire, for the record, into the success or failure of the predictions in the past.

In *City of Charlottesville v. FERC*, a split FERC had permitted a parent holding company to keep the tax savings from a consolidated return rather than allocating those savings to operating utility subsidiaries so that the savings could be passed on to their customers. The agency based its action on the economic theory that the parent would invest those savings in exploration and development of new supply sources, which would ultimately benefit the utilities and their customers. The dissenting FERC members objected on the ground that FERC had been pursuing this policy for years with no empirical evidence that parent companies really were channeling the savings into research and development, instead of just passing them through to their own shareholders. When the case came up for judicial review, the panel majority remanded it back to the FERC for lack of "evidentiary support for the proposition that [the agency's rule] will directly result in such development [of new supplies]." The majority opinion pointed out that "there is no indication that Columbia's exploration and development investments were any greater after FERC's change in tax cost policy than before the supposed incentive was created." In a separate concurrence I wrote:

Though this court in the past has approved agency use of predictive economic models in place of actual costs in ratesetting cases, we have always stressed that the agency must make "a conscientious effort to take into account what is known as to past experience and what is reasonably predictable about the future" to monitor whether the model's assumptions work in practice. In this case, the agency has made no attempt at all to verify the accuracy of its prediction that granting pipeline affiliated producers tax incentives will spur increased investment in research and development of natural gas supplies, although according to its own estimate, it has either followed or advocated following the challenged method of tax allocation for

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38. 661 F.2d 945 (D.C. Cir. 1981).
39. Id. at 951.
40. Id. at 953.
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seven years.\textsuperscript{41} However, the third member of the panel dissented, arguing that FERC, in putting into effect an economic policy designed to bring about a legitimate statutory end, was merely exercising its "predictive" policymaking function, and that policy must be presumed to be valid if theoretically sound.\textsuperscript{42}

\textit{Charlottesville} typifies the problem reviewing courts may have in sorting out what kinds, if any, of validating economic data are necessary in a particular instance to support, under the "substantial evidence" test,\textsuperscript{43} a decision based on an economic theory or model. But I believe that the effort is necessary and will often prove fruitful. Agencies may otherwise tend to gloss over past errors and insist that more of the same is the best remedy. A reviewing court, by insisting on validation where appropriate, can help keep the agency honest.

D. \textit{Balancing Economic Analysis Against Non-Economic Conditions}

Under some statutes, economic considerations are relevant but not determinative bases for agency decisions. Economic factors may compete directly with such non-economic considerations as fairness, safety, health, environment, or the survival of certain kinds of institutions. In such statutes, Congress envisions a multifactored decisionmaking analysis by the agency, with the initial balancing left to the agency but subject to review by the courts.\textsuperscript{44} Cases that arise under statutes of this sort are the most difficult cases, for they inevitably require the weighing of values that are not comparable: for example, the safety of miners versus the risk that mine-owners will cease operations if safety costs become too high,\textsuperscript{45} or the safety of automobile passengers versus the consequences for the automo-

\textsuperscript{41} Id. at 954-55 (Wald, J., concurring).
\textsuperscript{42} Id. at 958 (MacKinnon, J., dissenting).
\textsuperscript{43} Compare id. at 954 (majority remanded because FERC's policy choice was not based upon substantial evidence in the record) with id. at 957 (MacKinnon, J., dissenting) ("The 'facts' supporting a prediction of where the public interest lies are not susceptible to the same degree of proof as are the facts supporting, say, a decision to revoke a license. . . . ").
\textsuperscript{44} Compare Sierra Club v. Costle, 657 F.2d at 331 (Congress expected EPA to balance pollution control against possible adverse effects on coal market, impediments to long-term economic growth, and inhibition of technological innovation) with American Textile Mfrs. Inst. v. Donovan, 452 U.S. 490, 521 (1981) (Congress undertook its own cost-benefit analysis before enacting the Occupational Safety and Health Act of 1970, § 2(b), 29 U.S.C. § 651(b) (1976), and "[n]owhere is there any indication that Congress contemplated a different balancing by OSHA of the benefits of worker health and safety against the costs of achieving them."). See also Note, \textit{Significant Risk and Feasibility—A Paradigm for Interpreting Recent Supreme Court OSHA Decisions}, 56 ST. JOHN'S L. REV. 537 (1982).
\textsuperscript{45} See, e.g, United Mine Workers v. Federal Mine Safety & Health Review Comm'n, 671 F.2d 615 (D.C. Cir. 1982) (miner representatives are entitled to payment of wages for time spent accompanying federal officers on "spot" inspections).
tive industry of standards mandating the inclusion of expensive protective devices in new cars.46

Here the judge first looks to the statute—and its legislative history—for evidence that Congress had preferences or left instructions as to how the economic and non-economic considerations were to be balanced. These forays through the legislative history sometimes produce inconclusive or even contradictory results,47 but, on other occasions, they can be extraordinarily helpful.48 The judge then addresses the agency’s rationale to ensure that the agency considered the competing factors in a manner that is reasonably close to that which Congress intended. If it has—and if the agency’s economic analysis itself passes muster, according to the criteria discussed above—then the agency’s decision will probably withstand judicial scrutiny. The agency head who strikes the balance in the first instance has substantial leeway under most balancing statutes to elevate or downplay economic considerations as compared to other values protected by the statute, or to probe any inherent shortcomings of various economic assumptions, predictions, and logic.

It is possible, however, for a court to conclude from the statutory language or history that the agency’s economic analysis incorporates assumptions that are fundamentally at odds with a purpose or interest of the drafters of the statute. In such cases, the court cannot allow the agency to frustrate the legislative intent, and must order a fairer rebalancing.49


48. See, e.g., Consolidated Edison Co. v. FERC, 676 F.2d 763, 775-77 (D.C. Cir. 1982) (legislative history of the Natural Gas Policy Act confirmed that Congress left compensation for curtailments to commission’s discretion); Sierra Club v. Costle, 657 F.2d at 319-22 (legislative history of the Clean Air Act demonstrated agency’s authority to issue variable pollution standards).

49. See, e.g., American Elec. Power Serv. Corp. v. FERC, 675 F.2d 1226 (D.C. Cir.) (overturning FERC rules governing cogenerator facilities on the grounds that the rules were inconsistent with the purpose of the legislation under which they were promulgated), cert. granted sub nom. American Paper Inst. v. American Elec. Power Serv. Corp., 103 S. Ct. 206 (1983). But see id., 675 F.2d at 1247 (statement of Judges Wald and Mikva dissenting from denial of rehearing en banc) (FERC adequately balanced conflicting statutory interests); Power Mites Locked in Big Battle, Wash. Post, Aug. 12, 1982, at Cl, col. 4 (Congress readdressing the cogeneration issue because court decisions setting aside FERC rate orders resulted in financial institutions becoming wary of backing cogeneration projects).
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IV. Proposals for Cost Analyses for Major Rules

The limited experience of courts thus far in reviewing economic analyses could be expanded if pending measures on "regulatory reform" become law. Ironically, the major bills would increase the number of cases in which economic analyses would be presented for judicial consideration, but, at the same time, they provide that judicial review of such analyses would be even more limited than it is now.

Senate and House bills under current consideration require both a cost-benefit analysis and a cost-effectiveness analysis for rules with major economic, health, or welfare impact. They expressly limit judicial review of those analyses: Courts may not review the agency's determination that a rule is or is not "major" so as to invoke the requirement and "[a]ny regulatory analysis [required by the Senate bill] . . . shall not be subject to judicial consideration separate or apart from review of the rule to which it relates." The Senate and House Reports are emphatic that "judicial evaluation of the quality of these analyses would hamper achievement of this goal [of better agency decisions], not promote it."

The bills do require that the analyses be made part of the rulemaking record for the reviewing court's perusal. Thus, a reviewing court must consider the content of the analysis together with all the other information and rationales included in the rulemaking record in determining whether the rule is supported by "substantial evidence." How this form of limited review will work in practice deserves forethought. The House report says that if the rest of the record is devoid of justification, the analyses may not save it. The converse may be implicit, i.e., that if the rest of the record fully justifies the rule, the deficiencies in the economic analysis, no matter how severe, cannot jettison the rule. Yet the House report also acknowledges that "[i]f the analyses are patently inconsistent with the agency's explanation of the rule itself, the court may well ask whether the agency has provided a reasoned explanation for its action in adopting the rule."

50. H.R. 746, 97th Cong. 2d Sess. sec. 101, §§ 622-624 (1982); S. 1080, 97th Cong., 2d Sess. sec. 4, §§ 621-624 (1982) (as passed by Senate Mar. 24, 1982). See S. REP. No. 305, supra note 11, at 37 (Committee expects that only about one hundred rules a year will require a regulatory analysis).
51. See H.R. REP. NO. 435, supra note 11, at 49. S. 1080, supra note 50, sec. 4, § 623, permits a very limited review.
52. S. 1080, supra note 50, sec. 4, § 623(d).
53. H. R. REP. NO. 435, supra note 11, at 49; see S. REP. NO. 305, supra note 11, at 60-61.
54. H.R. 746, supra note 50, sec. 101, § 623; H.R. REP. NO. 435, supra note 11, at 49. S. 1080, supra note 50, sec. 4, § 623; S. REP. NO. 305, supra note 11, at 59; S. REP. NO. 284, 97th Cong., 1st Sess. 157 (1981); See also 128 CONG. REC. S2390 (daily ed. March 18, 1982) (statement of Sen. Laxalt) ("The analysis may not be reviewed apart from the rule to which it relates, coming before a court only as part of the whole rulemaking record.").
56. Id. at 50.
This is a difficult trail for an appellate court to follow. The message to a court seems to be: Read the analyses, determine the validity of the rule on the record as a whole, evaluate its reasonableness in part by comparing the analyses with other explanations in the record, but only in extreme cases permit the content of the analyses to tilt your decision in favor of or against the rule.

One of the Senate regulatory reform committee reports suggests more strongly that serious defects in the analyses may provide a basis for refusing to uphold the rule:

Where the party challenging the rule is able to identify inadequacies in the regulatory analysis, the court must determine whether those inadequacies are so serious as to warrant overturning the rule and remanding it to the agency for the development of a more complete record and the preparation of a more detailed analysis.\footnote{57. S. REP. NO. 305, supra note 11, at 59; see also S. REP. NO. 284, supra note 54, at 158 ("During its review of the entire administrative record, the court may find the discussion of the issues to be addressed in the final regulatory analyses to be so lacking that these weaknesses taint the competence of the entire record as a fair basis for the agency rulemaking.").}

At the same time, the Senate sponsors also envision a heightened deference to the agency’s analysis, in the context of the entire record:

Courts should give substantial deference to agency assumptions and conclusions in preparing the regulatory analysis. . . . This is especially important when dealing with inherently uncertain and ambiguous scientific assumptions and economic projections. . . . The Committee intends that courts accord a substantial degree of deference to agency determinations in reviewing compliance with section 622 and not subject such determinations to the “hard look” applied to other agency action. \textit{See, National Lime Ass’n v. EPA}, 627 F.2d 614, 651 (D.C. Cir. 1980).\footnote{58. S. REP. NO. 305, supra note 11, at 61.}

The Senate report seems to be saying that if the analyses are seriously deficient on their face or if, considered in conjunction with the rest of the record, they give rise to extremely troubling inconsistencies, the court may decide that an otherwise acceptable rule is arbitrary. But the problems with the analysis must be obvious—we should not look too hard for them.

Both reports raise perplexing questions about the scope of judicial review of the new cost analyses. These bills, if they pass, will introduce a new and even more deferential formula for judicial review of economic analyses than exists now. But how impenetrable will the Chinese wall around the analyses prove for judges? Obviously, if the rest of the record

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Judicial Review supports the rule, the regulatory analyses should change that result only if they suggest such fundamental inconsistencies that a court cannot distill a reasoned decisionmaking process from the record as a whole. What should be the result, however, if the cost factors are not treated elsewhere and if their analyses are so deficient, even under a "not-so-hard look" standard, that a court must conclude that the agency might have reached a different decision if it had a valid cost analysis before it? And if there is some but not enough evidence elsewhere in the record to uphold or defeat the rule, how can a court avoid the determinative effect of the analyses? One odd result may be a two-tiered level of review for economic analyses in the same case: extra-deferential for analyses required under the new law; traditionally deferential for those the agency may introduce in the record as part of its regular support case. That creates obvious incentives for the agency to manipulate which is which.

In general, though, the requirement of cost-benefit and cost effectiveness analyses should improve judicial review of rulemaking. Because the analyses, along with the comments they generate, will be part of the record, the courts will get not only more information but also an additional expression of agency balancing and reasoning.\textsuperscript{59} Also, heightened deference notwithstanding, courts must still in the end appraise the reasonableness of the analyses, the bases for the assumptions, and the inclusion of relevant factors, in deciding what weight to give analyses, whether they are consistent with the rest of the record, and whether they are so misconceived or executed as to make a court conclude that the rule is arbitrary. Ironically, the cost-benefit requirement under consideration could mean a greater not a lesser role for courts in reviewing economic analyses.\textsuperscript{60}

V. Conclusion

Despite the risk that they can be used to produce smoke rather than light, economic analyses are a welcome addition to agency decisionmaking and administrative adjudication. Well-conceived, well-implemented, and—most important—well-explained economic analyses or computer

\textsuperscript{59} Agencies may take greater care, because the analyses are in the record, to assure consistency between the analyses and the rest of the record, thereby providing an additional incentive to coherent rulemaking.

\textsuperscript{60} Testifying before the Senate Judiciary Committee, the Honorable Harold Leventhal stated: We would be looking at a problem that was identified or that came to our attention by virtue of material in the impact analysis, the regulatory analysis, without directly considering whether the regulatory analysis makes a full and adequate cost calculation. I don't think the matter is completely free from difficulties . . . and yet, I do see a basic line of division here which seems to me to be one the courts can live with, and work out and handle. \textit{Hearings on Regulatory Reform Before the Senate Comm. on the Judiciary}, 96th Cong., 1st Sess. 14-15 (1979).
models can inform the court of consequences of the agency's action about which it might otherwise have been unaware. The supplementary insights offered by the discipline of economics should have intellectual appeal to judges trained in the inductive, pragmatic, evidence-oriented legal process. Agency actions must accord with congressional directives and be reasoned in a way that is comprehensible to reviewing courts. We cannot be presented with a computer run or a series of mathematical equations as a substitute for a rationale. The agency and not the courts must translate the complex simulations and models into a layman's language, and explain adequately how it arrived at its result. Judges must be careful, however, not to become so enamored of the techniques of economic analysis that they invent inappropriate uses or confuse form for substance. The APA and various agency enabling statutes still command the field; due deference to agency expertise must be given, but time-honored standards of judicial review must also survive.

Private litigants can also be expected to raise increasingly sophisticated criticisms concerning an agency's economic analysis or lack thereof, to challenge the lack of record support for assumptions integral to a model or the omission of relevant factors from the agency's analysis. Unfortunately, these burdens may distance still further the affluent from the poorer litigants in our legal system. Public interest economists must step forward to assist legal services and public interest advocates who represent such groups as consumers, environmentalists, and the poorer recipients of governmental benefits. The gradual introduction of sophisticated economic concepts and techniques into the system of administrative law offers great promise for heightening the rationality of both agency behavior and judicial review, but equally great caution is in order to insure that they never be allowed to replace justice with cant, or to frustrate genuine judicial understanding of what is involved in each dispute.