POLICY SCIENCE IN THE LAND-GRANT COMPLEX: A PERSPECTIVE ON NATURAL RESOURCE ECONOMICS

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Natural resource economics has long been identified as a policy science. Its chief concerns—problems attributable to "market failures" of various kinds (e.g., Castle 1965) and the special difficulties that arise in intertemporal and intergenerational resource allocation (e.g., Solow)—inherently require some kind of public solution, whether it be by reaffirmation or redefinition of property rights, regulation, taxation policy, or public enterprise.

In a time of some general disenchantment with government and selective retrenchment of public sector activity, resource economists (and many other social and economic scientists) are receiving mixed signals. Mostly we tend to work in or for the public sector, the political stock of which is not exactly booming. To some extent we are associated with the search for environmental quality, which search seems to be slipping a little on the political agenda, but holding firm in the public opinion polls (Council on Environmental Quality; Resources for the Future, Inc.). Although we are linked with the public sector, we are firmly associated with the goal of efficiency in that sector and in the relationships among public and private sectors, a goal that is ascendant. Finally, among those of us in the USDA/land-grant college complex, there are some who fear that we may be considered somewhat peripheral—not to society in general, but to the concerns of the traditional leadership and clientele of that complex—and thus more expendable than others in a worst-case austerity scenario. In summary, the times are uncertain and the signals are mixed.

Reactions to uncertainty and perceived insecurity may run the gamut from calm reflection to blind panic. My personal reaction tends rather markedly toward the "calm reflection" end of that spectrum; I find considerable strength and reinforcement in scholarly, scientific and institutional traditions. However, conceptual rigor and logical construction are surely helpful, but they cannot complete the task alone: at some points, the argument relies on judgment.

RESOURCE ECONOMICS AND THE POLICY PROCESS

Resource economics seeks to generate the kind of information that influences policy and, in some of its more creative moments, it treats various aspects of the policy process itself as subjects for study. Thus, it can be placed in perspective only via a more general examination of the policy process and the role of economic science therein.

The Purpose of Policy and the Prescriptive Power of Economics

The purpose of policy is, surely, to do good. More specifically, it is to use the powers that individuals delegate to the collective (i.e., government) to serve the public interest and promote social well-being.

What then, does the economist know about what is good? Economic science has long been concerned with the concept of the social good and its implementation in economic planning. In a long and tortuous intellectual history, utilitarianism; the compensation test (potential Pareto-improvement) approach; and the Samuelson-Bergson social welfare function have been proposed, but found wanting. Arrow has denied the possibility of a single decision rule that will unambiguously determine which outcomes are optimal for society, without violating a minimal set of individualistic and democratic precepts. While the interpretation of Arrow's result is controversial, more recent analyses have generated a plethora of specialized "impossibility theorems" (Kelly). To my way of thinking, the most intellectually satisfying approach to defining the social good is that of Buchanan, building on the work of Rawls. Equity, or social justice, is defined in terms of process, rather than outcome. Justice is whatever emerges from just processes.

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Rather than attempting to define equitable outcomes for society, this approach seeks to establish the characteristics of a just process through which the members of society may reach a collective decision.

In brief, the Rawls-Buchanan approach has considerable intellectual appeal, but little immediate prescriptive power. If the economist is to contribute to the public policy process, it must be as a generator and disseminator of fundamentally limited information, rather than as an arbiter of good and evil.

Fortunately, there is some guidance available for the economic profession as it seeks to achieve some quality control over the information it generates and disseminates. The notion of scientific objectivity is also defined in terms of process, rather than outcome. The process of scientific objectivity involves the freedom and responsibility of the scientist to pose refutable and testable hypotheses; test them with relevant evidence; and report the nature of the hypothesis, the structure of the test, and the results of testing in a manner accessible to all interested persons (Popper). While the importance of the first two clauses is self-evident to all of those raised in the hypothesis-testing tradition of modern science, perhaps the third clause needs elaboration. Its purpose is to encourage the process of criticism, refutation, and confirmation among the scientist's peer group and others who feel themselves so qualified. The structure of the hypothesis, the logical consistency of the proposed test, and the quality of the data and the analysis brought to bear upon it must be able to withstand criticism, if the results are to gain credence. If an experiment or a statistical analysis is involved, the results must be replicable by independent researchers, if they are to be long believed.

The process of scientific objectivity serves a valuable role within the economics profession in controlling the quality of information generated and disseminated, and facilitating critical evaluation of the information in circulation—serving the policy process. However, scientific objectivity is entirely inadequate for (and even inapplicable to) the process of developing a consensus on goals.

The Policy Process

As Blaug indicates, the typical textbook message on the role of the economist as technocrat (I prefer "humble technician") in the policy arena—which message is a kind of popularized version of Robbins' doctrine (1935, 1981)—sees the economist as providing value-free information to "The Decision Maker" about the "possibility function," that is, the outcomes of alternative resource allocations and the foregone opportunities each entails. "The Decision Maker" specifies the objectives of policy and decides the course of action. However, I do not see the role of the economist in the policy process in these terms, and it is crucial to the argument that I explain why.

"The Decision Maker" is a fiction; not merely a convenient abstraction, but a fundamentally misleading fiction. Blaug says that policy decisions are made by teams; and that objectives and outcomes depend on which team member is in the ascendency at a given moment. Braybrooke and Lindblom suggest that the policy team starts not with defined objectives but with existing policies, and operates via disjointed incrementalism, a process in which both ends and means are adjusted piecemeal. However, none of this goes far enough for me. Drawing on some two decades of public choice literature,[1] I visualize a policy process that is very diffuse, with a wide variety of interests involved, and a large number of different arenas offering themselves as loci for conflict resolution: electoral politics; legislative and administrative institutions at the federal, state, and local levels; quasi-governmental organizations; the judicial system, with its courts and professional advocates; the public information media; and markets, large and small, but all subject to law.

In such a system, no one is entirely above self-interest. Even within government, different agencies may pursue conflicting goals; and individual public servants may pursue individual goals not always congruent with those of their department or the administration as a whole. Individuals within and without government will allocate their endowments—and endowments are broadly defined to include, for example, political contacts and information-media skills, in addition to income, wealth, education, and technical skills—across the various decision loci, to achieve their objectives. They may invest in order to maximize within existing institutions or to maximize via institution-changing behaviors. Individuals will perceive their best strategies differently and behave accordingly.

The distinction between government and the rest of society becomes blurred.[2] Individuals will seek some things through markets, and others through a variety of government institutions. Individuals will seek to use the power of government institutions to modify market behavior and market outcomes. Individuals will consider gov-

[1] Rausser et al. have identified three variants of the public choice approach (along with a fourth approach to endogenous government behavior, which derives from a radical-Marxian perspective and is thus generically quite different from the public choice approach). These are (1) the liberal-pluralist approach associated with Downs; Buchanan and Tullock; (2) the theory of regulation and income redistribution approach, associated with Stigler; Posner; Peltzman; Becker (1965); and (3) the rent-seeking society approach associated with Krueger. These variants are in many ways mutually compatible, and recent writings (e.g. Buchanan, Tollison and Tullock) suggest the emergence of a more integrated paradigm. My approach, while more intuitive than formalized, in this rendition, draws upon all three variants.

[2] Government and society should not be viewed as separate and exogenous; rather, government is best viewed as endogenous to society. Nevertheless, there remains a division of labor between government and the private sector. The dividing line is fuzzy in some instances, but it is crystal clear in others: the judiciary, for example, belongs in government. The interactions between the judiciary and the rest of society, however, are wonderfully complex.

ernment a potential employer; entrepreneurs will consider government a potential purchaser, pricemaker, and, perhaps, a provider of subsidized inputs. The policy process is diffuse, and almost everyone plays some part and has some influence therein.

Channels of communication are diffuse, rather than linear.[3] It is not always possible to predict in advance which individual(s) will make the final decision or, for that matter, which of the various arenas will be the locus for the final decision. In fact, few decisions are truly final. Most kinds of decisions—the exceptions including, for example, the irreversible destruction of natural environments—may be later reversed, often at some tolerable cost. This being the case, individuals and coalitions that are disappointed with particular decisions will continue to seek reversal of those decisions in the same arena and in others.

This diffuse public decision process has a voracious and omnivorous appetite for information, which is not merely accepted at face value, but metabolized. Many divergent kinds and qualities of information—fact oriented and in varying degrees accurate, inaccurate, or intended to mislead; goal oriented, and in varying degrees, conventional or revolutionary—compete for attention. Participants in the policy process constantly add to the stock of information: evaluating it; promoting the validity of some of it, while disputing other parts of it; and deleting that which fails to withstand critical examination.

The Role of the Economist

Since it is seldom possible to identify a single decision maker (D) in such a system, gathering and organizing information for D, and maximizing D's objective function are rather implausible roles for the economist (E). Not only that, but many E's will find that their information and analyses are being made publicly available in several different arenas, to many different individuals and organizations involved as participants in the decision process, and, ultimately, to the general public. E, not recognizing a single D, may play some part in the open debate about goals and objectives; the establishment of the research agenda; and, by publicizing his findings, may exert some influence on the way in which his results are used. E may find himself analyzing the decision process itself, and actively propose and lobby for its reform.

This role model for E is less restrictive in terms of the kinds of information generated and the permissible patterns of communication. "Positive" economic analyses of the kind endorsed by Robbins (1981) may legitimately co-exist with mission-oriented analyses and arguments directed toward clarifying and even promoting goals. Communications directly with a supervisor (himself a decision-middleman or an overt representative of some special cause) may legitimately co-exist with open publication directed at the scholarly, policy-community, educated lay-person, and general public audiences. The role model proposed here permits almost everything that other role models permit, and some additional things.

In place of strict ethical requirements that he confine himself to the "humble technician" role, E is constrained by his own professional ethics (which, one hopes, include scientific objectivity) and by the fact that nonobjective information and overtly normative positions are likely to be identified as such by others in the decision process. In that way, the harm that an incompetent or biased economist might do is minimized.

The public derives its necessary protection from the would-be economic technocrat, not from the latter's having taken the "humble technician's" vows of value-freedom and subservience to D, but from the critical process, which is encouraged by the unrestricted flow of information of divergent kinds and qualities. Thus, there emerges a strong link between the process of scientific objectivity and the critical process essential to evaluating information in the diffuse decision process. The advancement of knowledge and the functioning of an open society both work best when the generation, flow, and evaluation of information are not controlled by a central management, but, instead, emerge from the independent efforts of myriad thinkers, advocates, and critics.

Economists in the Land-Grant College System

Recognition of the diffuse nature of the public policy decision process implies awareness of the diversity and decentralization that characterize information channels. Workers in the information system (who surely include, but are by no means limited to, research and extension personnel in the USDA/land-grant-college complex) responsive to different clientele groups. They work under different kinds of conditions and constraints, define problems differently, generate various kinds of outputs, and enjoy pecuniary and prestige rewards in relative and absolute amounts. The diffuse public decision process implies a considerable specialization and division of labor, even within the sector that generates and disseminates information.

While this sector, taken as a whole, is diverse and decentralized, that does not necessarily imply diversity and decentralization within every one of its component sub-sectors. Some sub-

[3] Linear communications channels, strictly defined, work only in two directions. One variant, commonly used in conceptualizing communications within government, is the vertical communication channel, which works only up and down. A decision maker at the top defines the problem and transmits task statements downward, through several layers of staff. On completion of each task, the resulting output is transmitted upward until, eventually, the decision maker receives the needed information. At each point, communication with "outsiders" is discouraged.

sectors (most obviously those concerned with advocacy for particular interest, viewpoints, and outcomes) may function effectively under tightly controlled, top-down management. Nevertheless, I argue that the land-grant-college complex functions best when it encourages internal diversity and decentralization of effort.

University personnel—by nature of their rigorous education and training, their adherence to scientific traditions and the process of scientific objectivity, the public nature of their financial support, and the traditional dedication of their host institutions to freedom of expression and openness in debate and criticism—are uniquely placed to contribute to generating and critically evaluating diverse information incriticism in an open society. The university as an institution evolved specifically to meet these needs, and it continues to attract personnel whose value systems are compatible with these specialized tasks. The university *is* a special kind of institution.

The land-grant university has always made its case for public support on the basis that it serves two kinds of functions: (1) the traditional function discussed immediately above; and (2) a more programmatic (or popular) function, that is, it operates programs that directly service the needs of identifiable clientele. Castle (1971) has astutely observed the inherent tension between the traditional and popular functions. He suggests that, while this tension may be in some ways constructive, there is no automatic mechanism to ensure it will be so. Thus, any balance is precarious and in need of constant tending.

The traditional functions of the university are obviously directed at serving society's needs for a decentralized source of diverse, but high-quality, information and critical evaluation. However, the popular functions, in many of their manifestations, may serve the same role, albeit in a more programmatic manner. If there is a problem, it is not with the popular functions *per se*. Rather, the need is to enhance the complementariness between traditional scholarly functions and the popular functions, while guarding against the kinds of entanglements with special interest clientele which ultimately destroy scientific objectivity and undermine the claims of the university to be a special kind of institution.

As the system has grown in recent decades, there has been some inclination to emphasize the programmatic functions—to promise targeted programs, an organized team approach to generating and disseminating information, and more streamlined delivery of usable results—in order to generate support for continued growth.

More recently there has developed a rhetoric promoting the same approaches for survival in a time of austerity. Judging by what we tell each other in public, more systematized management and accountability offer our best hope for the future.[4] Whereas research (and, to a lesser extent, extension) in the land-grant universities have traditionally resembled cottage industries,[5] there is now a tendency to promote a more industrialized management style. Institutionalized prioritizing is being promoted to cure whatever diseases that arise from the customary, rather independent, procedures in which scholars select the objects of their inquiry. While *ex post* analyses strongly suggest that the customary ways of doing things have been cost-beneficial in the past, there is now some pressure for research resource allocation based on *ex ante* analyses of benefits and costs.

Shumway's reaction to these observed trends is interesting and instructive. He stresses the demonstrated productivity of the land-grant college system under its customary procedures, and suggests that a less decentralized and more industrialized approach to research and extension management may reduce the aggregate capacity of these institutions to adapt to newly emerging realities. These concerns are legitimate. There is an additional argument in favor of decentralization and diversity within the land-grant college complex. It seems that the complex is already beginning to suffer some attrition to human capital. The decline in relative salaries during the past decade cannot have been helpful. However, I believe that a major portion of the finest talent is attracted to the universities, in spite of salaries, by the working conditions therein. Especially attractive is the encouragement of independent inquiry in an environment that protects the individual, in order to free him/her to pursue knowledge and excellence with imagination and creativity. If I am correct, the imposition of institutionalized prioritizing, heavy-handed management, and restrictive accountability, in a time of declining relative salaries, will surely exacerbate talent attrition in the universities, to some extent undermining their fundamental *raison d'etre* as distinct institutions.

Thus, I conclude that the needs of society, and those of the university itself, will be best served by maintaining decentralization of effort and diversity of output.

At this point, it is important to draw a clear distinction between decentralization and anarchy. It is not my position that research and extension workers should be free from the discipline of rewards and punishments, incentives and dis-incentives. Rather, society is best served by a land-grant complex, whose personnel retain considerable freedom to interpret and respond to the quite considerable array of incentives emanating from diverse sources. These incentives include

[4] This kind of discussion was prominent at the 1981 annual meeting of AAEA. Phillips and Dalrymple wholeheartedly embrace this kind of rhetoric; and Stanton and Farrell perhaps reluctantly, submit to it.

[5] This language has a similar tone to that of Shumway, who speaks of researchers as independent entrepreneurs. Nevertheless, it is well to recognize the role of the university in providing a considerable guarantee of sustenence and shelter for the individual researcher.

those established by internal fund allocation procedures, a wide variety of extra-mural funding sources, the employing institutions' personnel procedures, and the professional and scholarly societies that offer various forms of individual recognition which influence one's standing with funding agencies and personnel administrations.

For researchers, the necessary conditions for success are to be funded and published, and peer review plays a considerable role in both processes. These various incentives are themselves responsive, albeit imperfectly so, to the needs of the broader society.

By establishing costs and rewards for various undertakings and products, this structure of incentives bounds the freedom of individual researchers and extension workers to choose among alternative activities, and directs effort into promising avenues. A major role of college administration is in managing the system of incentives, and assisting researchers and extension workers to perceive and interpret the signals. All of this I accept. However, I argue strongly against any major increment in centralized management and direction of research and extension. Rather than substitute a centralized signaling system for the decentralized one that has long existed, we should seek ways to improve the latter and defend it (Castle 1981).

It is important that other institutions, special interests, and the public at large perceive the good that we do. Thus, college administrations have a considerable task in reaffirming the basic utility and productivity of the USDA/land-grant university research and extension complex. The record is such that support can be sought without accompanying promises of radical internal reorganization.

Resource Economists in the Land Grant College Complex

Here, it is appropriate to draw attention to specific attributes of resource economics, and develop the implications for professionals in the field.

The ties that bind resource economics and the land-grant colleges of agriculture are simply not as direct and strong as those pertaining to, say, agricultural production and marketing. Except in the western states (where government influence in agricultural factor markets, especially those for land and water, is broad and deep), resource economics is, in historical perspective, a recently acquired interest for many colleges of agriculture. In recent decades, the growth in resource economics in those colleges has been paralleled by a similar growth in economics departments. Thus, practicing resource economists may find that their peer-group communications network includes many who are not located in colleges of agriculture. Similarly, the immediate clientele for the kinds of information generated by resource economists includes many who have not acquired the habit of looking first to the colleges of agriculture.

Many (but by no means all) of the aggregate efforts of resource economists are addressed to problems concerning externalities, public goods, and goods with poorly developed markets. These are important problems in a complex society, and resource economists are making significant contributions to their resolution. However, this kind of work may make resource economists less popular with commercial interests organized on an industry basis and more popular with the diffuse public. The resource economist may acquire public friends and private enemies.

For these reasons, some resource economists in the land-grant-college complex exhibit symptoms of insecurity. They are concerned that their area of specialization is more nearly peripheral, than central to the concerns of college administrators and their traditional clientele groups. Further, they worry that, while all the signs are that the demand for resource economics services remains healthy, their college administrators are not well placed to assist them in tapping that demand. Clearly, there is a need to develop strong linkages between the colleges of agriculture and those who demand resource economics services. Some, but not all, researchers are skilled at that kind of work; and some, but not all, college administrators have a comparative advantage in reaching the clientele for resource economics. Clearly, there is work to be done. However, for the longer haul, there is reason for optimism; I believe the demand for the things we can do is so fundamentally strong that a little hesitancy and a few mistakes will not doom us to oblivion.

INTERPRETING THE SIGNALS

Having urged rejection of some current calls for institutionalized prioritizing, more heavy-handed management and accountability, it would make little sense for me, at this point, to presume to tell the profession what its priorities should be. Nevertheless, a little intelligence relative to the incentive signals and the short-to-mid-term direction of their movement may be helpful to each of us, as we seek to make decentralized and diverse decisions about allocating our scarce intellectual resources.

Theory, Method, and Application

Above all, our institutional and professional rhetoric glorifies the applied; while that emphasis is appropriate, it carries some risks. Specifically, if we dichotomize professional effort into two classes—development of theory and method, and application—there is a risk that the term

"applied" may develop the kinds of connotations that suggest it as a synonym for "uninspired and pragmatic" and an antonym for "innovative and rigorous." Rather, "application" should mean something like "the purposeful direction of ingenuity toward removing impediments to human progress." Then, any dichotomy between theory and method, on the one hand, and application, on the other, disappears. Weakness in theory and method is often the immediate impediment to solution of applied problems.

There have been considerable developments in theory and method during the last decade, many of them immediately applicable in resource economics. To mention a few: endogenous theories of government (footnote 1); duality theory; the "new consumption theory" of Lancaster and Becker; hedonic price theory; considerable developments in consumer's surplus and welfare change measurement; the theory of discrete choice; and estimation methods for discrete and discrete-continuous choice models. If anything, the change is gaining pace. Witness last year's developments in welfare measurement in a discrete choice framework (Small and Rosen) and exact consumer's surplus (Hausman). Surely, we need to keep abreast of contemporary developments in theory and method. Moreover, all but the most complacent applied researcher will from time to time be dissatisfied with the capacity of current theory and methods to remove impediments to completion of his/her work. When the immediate problem lies in theory or method, let us not allow our institutional rhetoric to divert us from it.

Optimization and Benefit Cost Analysis

The diffuse model of the public decision process has clear implications for the practitioner of science, in the way problems are defined, the kinds of information generated, and the nature of the communication process.

In the "E provides value-free information and D decides" model of the public decision process, optimization and benefit cost analysis (BCA) have central roles. D specifies objective functions to be maximized and decision criteria to be implemented. The communication process between E and D may be linear: D provides objectives and constraints for E, who performs analyses and transmits the results to D; nobody else really needs be involved.

In the diffuse decision process, many participants seek a wide variety of information. The notions of objective functions to be maximized and decision criteria to be strictly applied recede into the background. Empirical optimization and BCA have fundamentally different roles. Such analyses may well be performed, but their results are viewed as merely one among many kinds of informational inputs, and may serve merely to focus attention on other more strategically important elements of the problem at hand. Optimization techniques are empirically applied in a "what if" frame of mind, and the sensitivity analysis is of more interest than the optimal solution.[6] Similarly, BCA is informational, rather than prescriptive. Many of the participants in the decision process may have their own (substantive or polemical) reasons for wanting to know something about, say, the relative magnitudes of national economic development benefits and costs. Each participant will use that information, along with many other kinds of information, for his own purposes, and it is relatively unlikely that any will be in a position to impose the outcome suggested by BCA.[7]

The diffuse public decision process implies only a limited role for optimization tools and decision criteria. The research community best adapts to this kind of decision environment by diversifying its output, publishing its findings widely, and doing all it can to maintain the open information channels upon which the critical process demands.

Policy Proposals

The research and scholarly community is a source not merely of policy-relevant facts, but also of policy proposals. Again, the concept of the diffuse decision process is instructive. If a proposal is to be implemented, that occurs not through convincing D of its validity, but through convincing a winning coalition of interests that it will be to their benefit. The economist who believes that he has identified a worthwhile policy proposal should publicize that information widely so that potential gainers and losers have an information base on which to act. Any worthwhile proposal will have its beneficiaries, who, of all people, should be made aware of their potential good fortune. Further, proposals with few big losers have the best chances of implementation. So, it behooves the economist to search for, and publicize, policy innovations with built-in compensation mechanisms. Compensation of those who are now gaining from inefficient arrangements may often be a reasonable price for efficiency-inducing change (Buchanan 1977).

Topics for Attention

The preceding argument for decentralization and diversity extends to the selection of particu-

[6] Optimality concepts remain central tools in the development of economic theory and method. The comments in this section are not addressed to optimization in that role, but to attempts to empirically solve complex optimization models with a view to identifying the "best" alternative solution to some practical policy problem.

[7] Recently, the Office of the President issued a directive that elevated the role of BCA in analysis of regulatory initiatives; it offers increased opportunities for benefit cost analysts and those skilled in valuation of non-marketed goods, and is likely to encourage various improvements in the theory and application of BCA. Nevertheless, I predict that the technical and political limitations of BCA will eventually become apparent, even to its promoters within the administration, and BCA will emerge as a (fundamentally limited) information system rather than a strict decision rule.

lar topics for the attention of researchers and extension workers.

Not surprisingly, there are some striking regional patterns in the aggregate allocation of effort to, and among, resource economics topics in the colleges of agriculture. For resource economists, geography and regional economy do seem to spell destiny. In the farm-belt states, management of the residuals generated in on-farm agricultural production seems a prime concern, competition from non-farm sources for farmland a somewhat lesser concern, and whatever comes next seems to rank a distant third. Those in coastal states, mountain states, and upper Great Lakes states seem to exhibit greater diversity in their aggregate efforts, and additional concerns receive considerable attention: marine economics, coastal zone management, recreation economics, surface and groundwater management, and the complex interactions among urban and rural demands for a wide variety of natural resources. The western states have a longer tradition than most in resource economics and special concerns with relation to public/private interactions in land and water management and forestry, and agricultural/urban competition for water in an arid environment. Concerns with accommodating urban growth are strongest in those states that are experiencing rapid urban growth. On the other hand, almost all states have pockets of decline and decay, and management of those problems gets a little attention in many places. While energy is a hot topic in popular discussion, its ramifications for resource economics vary according to the regional economy. The problems are: growth management in the energy-surplus states; the price and availability of fuel and fertilizer, and the potential of agriculture as a source of energy in the farm-belt states; adjustment to increased water pumping costs in the arid states; and social adjustment problems in many states.

Since resource economics is, in historical perspective, a fairly recent concern in many southern colleges of agriculture, there is some tendency to survey the nation when looking for role models. The leadership of many colleges is farm oriented. Some of the finest graduate schools in agricultural economics are located in the farm-belt and, not surprisingly, they educate many of those who eventually find work as resource economists in the South. For these reasons, it may be that the farm-belt role model enjoys a head start.

I would not argue that this role model should have no influence in the South; however, major opportunities will be lost, it if becomes dominant. The geography of the South suggests concerns with marine economics, coastal zone management, outdoor recreation, water quantity in the South/West border states, and water quality in most all of the southern states. Recent trends in the regional economy suggest a reexamination of the "Sunbelt" myth (Bluestone). Florida and the energy-surplus states continue to experience rapid growth, but growth in the remaining southern states seems to be slowing down. Sunshine surely helps, but it does not seem to be a sufficient condition for exuberant long-term growth. Nevertheless, the southern economy is performing differently from the north central economy in important ways: more rapid population and employment growth, and more rapid growth in non-farm employment and metropolitan employment. While agriculture is important in the southern and north central regional economies, in a relative sense, the South is becoming less agriculture dependent.[8]

Thus, while some work on farm production residuals, agriculture as an energy source, and urban/agricultural competition for land are surely appropriate in southern land-grant colleges, the demand for resource economics services in the South is much more broadly based. The only question is whether resource economists in the land-grant colleges will play a considerable role in servicing these diverse demands, or will abandon these fields to others. Taking the latter path would leave us much the worse off, by limiting our horizons, our ability to recruit new talent, and our opportunities to interact with professional peers, many of whom work outside of the colleges of agriculture.

A CONCLUDING COMMENT

My feeling is that the resource economics profession is not doing badly and that its basic instincts are rather sound. We can all learn from new ideas, and many of us could use a little guidance as we make minor mid-course corrections. However, we would be unwise to allow ourselves to be panicked into abandoning those directions that are fundamentally valid and tenable.

The course that I would recommend for the profession in aggregate involves perhaps some tilting in the direction of theory and methods de-

[8] Southern and north central shares of total farm marketings have held fairly constant from 1965 to 1979.

Year	Southern share %	North Central share %
1965	30	42
1969	29	43
1974	28	46
1979	30	43

(Source: *Statistical Abstract of the U.S.*, for the years reported).

However, as Bluestone reports, population, total employment, non-farm employment, and metropolitan employment are growing faster in the South than in the north central region. Thus, the *relative growth* in the southern economy has been mostly non-farm growth.

velopment, a minor reorientation of thinking about optimization models and decision rules, and some steadfast leaning against certain winds (see text *circa* footnote 4) that are current but, I would expect, more ephemeral than many of us perceive. In particular, diversity of topic, approach, and output, and decentralization of decision making about allocation of research and extension resources are values worth fighting for. Our success in this fight will eventually be seen as having benefited ourselves, our land-grant complex institutions, and the public at large.

REFERENCES

Arrow, K. *Social Choice and Individual Values*. New York: John Wiley and Sons, 1951.

Becker, G. S. "A Theory of the Allocation of Time." *Econ. J.* 75(1965):493–517.

Becker, G. S. *A Positive Theory of the Redistribution of Income and Political Behavior*. Mimeo, Uni. of Chicago, 1980.

Blaug, M. *The Methodology of Economics, or How Economists Explain*. Cambridge: Cambridge University Press, 1980.

Bluestone, H. "Economic Growth of the South versus Other Regions: Past Trends and Future Prospects." *S. J. Agr. Econ.* (this issue).

Braybrooke, D. and C. Lindblom. *A Strategy of Decision*. New York: Free Press, 1963.

Buchanan, J. *Freedom in Constitutional Contract*. Texas A&M University Press, 1977.

Buchanan, J. and G. Tullock. *The Calculus of Consent*. Ann Arbor, Uni. of Michigan Press, 1952.

Buchanan, J., R. Tollison, and G. Tullock. *Toward a Theory of the Rent-Seeking Society*. Texas A&M University Press, 1980.

Castle, E. "The Market Mechanism, Externalities, and Land Economics." *J. Farm Econ.* 47(1965):542.

Castle, E. "The University in Contemporary Society." *Amer. J. Agr. Econ.* 53(1971):551.

Castle, E. *Agricultural Education and Research: Academic Crown Jewel or Country Cousin?* Washington: Resources for The Future, Inc., 1981.

Council on Environmental Quality. *Public Opinion on Environmental Issues, Results of a National Public Opinion Survey*. Washington, 1980.

Downs, Anthony. *An Economic Theory of Democracy*. New York, Harper and Row Publisher, 1957.

Hausman, Jr. "Exact Consumer's Surplus and Deadweight Loss." *Amer. Econ. Rev.* 71(1981):662.

Kelly, J. *Arrow Impossibility Theorems*. New York: Academic Press, 1978.

Krueger, Anne O. "The Political Economy of the Rent-Seeking Society." *Amer. Econ. Rev.* 64(1974):291–303.

Lancaster, K. *Consumer Demand: A New Approach*. New York, Columbia Uni. Press, 1971.

Office of the President. "Executive Order 12,291." *Federal Register* 46(33):13193, February 19, 1981.

Peltzman, S. "Toward a More General Theory of Regulation." *J. of Law and Econ.* 19(1976):211–40.

Phillips, M. and D. Dalrymple. "US Food and Agricultural Research Assessment: Implications for Agricultural Economists." *Amer. J. Agr. Econ.* 63(1981):990.

Popper, K. "Philosophy of Science: A Personal Report," in *British Philosophy in Mid-Country*, C. Mace (ed.). London: Allen and Unwin, 1957.

Poser, R. A. "Theories of Economic Regulation." *Bell J. of Econ.* 5(1974):213–36.

Rausser, G., E. Lichtenberg, and R. Lattimore. "Developments in Theory and Empirical Application of Endogenous Governmental Behavior," in *New Directions in Econometric Modeling and Forecasting in U.S. Agriculture*, G. Rausser (ed.). Amsterdam: North Holland, forthcoming.

Rawls, J. *A Theory of Justice*. Cambridge: Harvard University Press, 1971.

Resources for the Future, Inc. "National Environmental Survey Results." *Resources* 66(1981):13.

Robbins, L. *An Essay of the Nature and Significance of Economic Science*. London: Macmillan, 1935.

Robbins, L. "Economics and Political Economy." *Amer. Econ. Rev., Pap. and Proc.* 71(1981):1.

Shumway, C. R. "Subjectivity in *Ex Ante* Research Evaluation." *Amer. J. Agr. Econ.* 63(1981):169.

Small, K. and H. Rosen. "Applied Welfare Economics with Discrete Choice Models." *Econometrica* 49(1981):105.

Solow, R. "The Economics of Resources or the Resources of Economics." *Amer. Econ. Rev., Pap. and Proc.* 64(1974):1.

Stanton, B. and K. Farrell. "Funding for Agricultural Economics: Needs and Strategies for the 1980's." *Amer. J. Agr. Econ.* 63(1981):796.

Stigler, G. J. "Theory of Economic Regulation." *Bell J. of Econ.* 2(1971):3–21.

U.S. Bureau of the Census. *Statistical Abstract of the United States*. Washington, D.C., 1965, 69, 74 and 79.