

Land-Use Planning: Implications of the Economic Calculation Debate*

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The recent widely cited National Agricultural Lands Study (NALS) adds to the growing number of individuals and organizations holding the view that land resources are too important to be left to the "whims of market forces."¹ In this view, there should be a shift from private ownership of land to social or political control of land use. Bjork, for example, suggests that planning policies should be instituted at the federal level to estimate the derived demand for agricultural land for twenty-five to fifty years into the future and then steps taken to ensure its availability.² Similar conclusions were reached in the National Agricultural Lands Study and in recent CAST (Council on Agricultural Science and Technology) studies.³

The proposed solution, however, ignores or discounts the importance of several key problems. What is the best way to provide for future requirements of agricultural land? What are the likely effects of substituting central direction for the price system in land markets? Even more basic, is there a realistic alternative to the price system in allocating land resources? The purpose of this paper is to demonstrate the relevance of the economic calculation debate, that raged from 1920 to 1940, to these and other questions related to efficient use of land resources.

The economic calculation debate was over the feasibility of central planning. Specifically, Ludwig von Mises argued in 1920 that socialism was incompatible with rational economic planning.⁴ The argument was that without market prices there is no possibility of allocating resources on the basis of consumer preferences.⁵ The Mises argument was elaborated more completely by F. A. Hayek, but its significance was not realized by mainstream economists during the debate and was lost in the aftermath of the Keynesian revolution of the 1930's. The relevance of

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this debate to issues involving economic planning of land use and other resources has only recently been rediscovered.⁶

The limitations of central planning identified by Mises and Hayek have not been resolved and apply generally when resources are allocated through non-market methods. In this study, the implications of the economic calculation debate are related to centralized land-use planning, including the preservation of agricultural land.⁷ The objectives of this paper are twofold: (1) to briefly review the economic calculation debate, and (2) to relate the implications of this debate to land-use planning and the protection of agricultural land.

Economic Calculation Debate⁸

The economic calculation debate began in 1920 with the publication of Ludwig von Mises's "Economic Calculation in the Socialist Commonwealth."⁹ Mises stressed that producers and consumers cannot make rational economic decisions without market prices. Without such knowledge, Mises argued, there is no possibility of calculating costs or revenues and no way of knowing if products most highly valued by consumers have been produced. He concluded that rational calculation, in the sense of adjusting production to the satisfaction of human wants, is impossible in a centrally directed economy from which prices are necessarily absent. The market, in contrast, allocates resources on the basis of expected profitability. When, for example, there is an increase in the expected price of corn relative to soybeans, farmers shift more land into corn production. In arguing that economic resource use is possible only if prices are applied to intermediate products and factors of production as well as final products, Mises contended that no other conceivable process can take account of all the relevant facts as fully as do market prices.

Although the thesis was hotly disputed for twenty years after 1920, there is still no consensus concerning the significance of the debate. In convincing his socialist critics of the importance of market prices, Mises inspired attempts by those critics to duplicate the efficiency of markets through "market socialism"; that is, to develop methods by which a central planner could determine economically rational product and factor prices in the absence of private property. The best known is a simulated market proposal by Oskar Lange.

To recall the bare essentials: households have freedom of choice of occupation and consumer's goods. Managers of publicly-owned enterprises and industry authorities also have discretion over their productive inputs and outputs, but must observe two rules: to produce any output with a least-cost input mix and to produce an output at which marginal cost equals price. The Central Planning Board (CPB) coordinates these activities by endeavoring to fix prices that will equate supply and demand for each good and service.¹⁰

This market socialism approach demonstrates that, given crucial data, central planning is possible.¹¹ If, for example, data on land resources, production alternatives, and consumer preferences are accurately known, then the central planner can determine the efficient use of land in agricultural and other uses. As

demonstrated in the present discussion, however, there is no known way through which the planner can obtain these data. Thus, Hayek argued, this approach merely assumes the economic problem away. While market socialism is not logically contradictory, it is practically impossible because of information problems.

Even though Hayek's arguments were never refuted, it is still widely accepted by economists that the critics of market socialism have not proved their case. Musgrave, for example, in a recent study assessing the outcome of the economic calculation debate concludes: "planning emerged as feasible. . . . An efficient solution could be secured a la Lange by letting the planners simulate a competitive market."¹² Arrow reaches a similar conclusion: "Indeed, with the development of mathematical programming and high speed computers the centralized alternative no longer appears preposterous. After all, it would appear that one could mimic the workings of a decentralized system by an appropriately chosen centralized algorithm."¹³ Improvements in programming and computer technology in fact will not solve the information problems identified by Mises and Hayek.

Market Socialism versus Robbinsian Maximization

Why do economists often fail to take account of the information problems inherent in market socialism? There is a marked similarity between the approaches of market socialism and of conventional neoclassical theory. Consider the Robbinsian maximization view of economics that has dominated the profession since the early 1930's.¹⁴ In this approach, the individual is seen as confronted with an economic problem, viz. the allocation of *given* means among *given* ends to secure the greatest amount of satisfaction. When the economic problem is conceived in this way, the decision maker's role is reduced to that of mere calculation.¹⁵ That is, if data are given to the decision maker, there is no uncertainty, and without uncertainty there is no scope for choice.¹⁶ Moreover, to assume that economic data are *given* is to assume away the economic problem, regardless of the type of economic system.¹⁷

The decision maker, of course, is seldom if ever *given* the data. In fact, determining the possible means and ends is a key function of the entrepreneur; and, as Kirzner suggests, making the right decision calls for far more than correct mathematical calculation.¹⁸ A farmer's success in determining the most profitable pattern of production and land use, for example, is likely to hinge much more on the ability to recognize current opportunities and to anticipate future conditions than on expertise in mathematical programming and decision theory.

Successful decision makers must not only economize in situations where the data are already known but also be alert to new opportunities that other entrepreneurs have not yet noticed. In competitive equilibrium, however, the decisions of all market participants dovetail completely so that there are no profit opportunities and, consequently, no need for entrepreneurship. Thus, the conventional equilibrium-based approach tends to obviate the role of entrepreneurship by ignoring or assuming away information problems.¹⁹

In a similar manner, market socialism also tends to assume away information

problems and to reduce the economic problem to calculation. If it is assumed that data on preferences, available resources, and production opportunities are given, the Central Planning Board need only solve the constrained optimization problem, publish the shadow prices, and "order factory managers to maximize their profits."²⁰ Proponents of marginal-cost pricing often fail to take into account or minimize the importance of information problems inherent in this approach. Baumol, for example, identifies two problems in the application of marginal-cost pricing—the equilibrium that results maximizes private rather than social benefits, and marginal-cost pricing results in firm losses where average costs are decreasing. He does not, however, mention the more basic problem of information.

Hayek stresses that procedures to simulate market activity are not operational because the necessary data cannot be obtained.²¹ Since information in the real world is vast, detailed, constantly changing, and specialized to the decision maker, the information that motivates individual choice cannot be neatly summarized in objective demand and cost functions for use by central planners.

What is the basic economic problem facing society? If the relevant information were given, the problem of economic resource use would be reduced to one of logic or mathematics and the solution could then be stated in terms of the usual optimality conditions for consumers, firms, and resource owners. As Hayek emphasized, however, this is not the economic problem which society faces:

The reason for this is that the "data" from which the economic calculus starts are never for the whole society "given" to a single mind which could work out the implications and can never be so given. . . . The economic problem of society is thus not merely a problem of how to allocate "given" resources. . . . It is rather a problem of how to secure the best use of resources known to any of the members of society, for ends whose relative importance only these individuals know.²²

Thus, the economic problem facing society is not solved by showing how a unique solution could be determined if all the facts were known by a central planner. Any useful approach to the problem must show how to produce a solution that utilizes the partial knowledge of all interacting individuals in the market. Both the conventional maximization approach and market socialism fail to consider the implications of the subjective and decentralized nature of the data that motivate choice by individual decision makers.

Market socialism is also similar to the approach of conventional welfare economics in the use (or misuse) of the optimality conditions of competitive equilibrium as a norm. Welfare theory demonstrates that *given* a competitive equilibrium, the well-known optimality conditions hold and there is efficiency among consumers, firms, and resource owners. The optimality conditions of the competitive equilibrium, however, are of little use in assessing the efficiency of market activity in the real world. Competitive equilibrium in any market implies perfect competition, which requires price-taking behavior and a "perfect market," with perfect communication, instantaneous equilibrium, and costless transactions.²³ Since *all*

real-world markets fall short of these requirements, they will inevitably appear to be inefficient when measured against this benchmark.²⁴

In summary, conventional welfare theory *assumes* a competitive equilibrium and then uses the resulting optimality conditions as a norm in assessing the efficiency of real-world markets. Since no real-world market measures up to this standard, market failure is inevitable. When agricultural land markets are measured against the norm of perfect competition, for example, monopoly, externality, and information problems are revealed. Market socialism, however, accepts the same norm and shows how the central planner with data *given* can simulate optimality conditions. Since no real-world socialist economy can measure up to this standard (perfectly competitive equilibrium), "socialist failure" is also inevitable. The success of market socialism was (and is) judged largely on the basis of theory in which data are merely assumed available rather than on actual results of central planning, whereas real-world markets in the "market failure" approach are evaluated against the benchmark of perfect competition. In reality, as emphasized by Mises and Hayek, real-world markets should be compared with the results of central direction as it operates under real-world conditions.

Implications for Land-Use Planning

The implications of the economic calculation debate apply in land-use planning, just as they do in allocation of any other resource by non-market means. Perhaps because of the failure to fully appreciate the data problems inherent in all non-market resource allocation procedures, information problems have received relatively little attention in the land-use-planning literature. In order to appreciate the problems that arise if price signals are ignored in land markets, consider how the market makes use of widely dispersed information and knowledge in shifts of land from agricultural to non-agricultural uses. Individual preferences for housing, golf courses, and other uses are transmitted through the price system and reflected in higher prices of land available for these uses. Yet, individual landowners need not know about construction costs or the relative demands of land for housing, recreational activities, or agriculture. Thus, by coordinating and transmitting widely dispersed information, prices act to harmonize the separate actions of different people, and it is significant how little individual participants need to know in order to be able to take the right action.²⁵

Use of Knowledge in Land-Use Decisions

In allocating land resources through central direction, information problems arise similar to those in economic planning generally. The theoretical basis of land-use planning is deficient in that no way has been found to solve the information problems inherent in all central economic planning.²⁶ In view of the lack of an adequate intellectual foundation for land-use planning, the widespread dissatisfaction with comprehensive land-use plans is not surprising.²⁷

Similar problems are also endemic in the "scientific" approach to public land management. The aim of the early conservation movement in the United States was to introduce "scientific management" into government.²⁸ If government is to function efficiently in managing natural resources, according to this view, politics must be confined to specifying general policy directions, leaving the actual administration to skilled professionals. In view of the inherent information problems (and the public choice considerations to be discussed here), the current dissatisfaction with the results of "scientific management" of rangelands, forests, and other publicly owned lands is not surprising.²⁹

What data are required to determine efficient land use? The same data indicated by Lange as required for central planning generally—data on preferences, resources, and production opportunities. These data are, of course, not given; and the land-use planner who attempts to obtain the relevant statistical data faces problems similar to those identified by Hayek:

The statistics which a central authority would have to use would have to be arrived at precisely by abstracting from minor differences between the things, by lumping together, as resources of one kind, items which differ as regards location, quality, and other particulars in a way which may be very significant for the specific decision. It follows from this that central planning based on statistical information by its nature cannot take direct account of these circumstances of time and place.³⁰

A crucial implication of the economic calculation debate is that prices are necessary for rational land-use planning. Yet, this fact is ignored in most land-use-planning literature where land classification is presented as an alternative to market prices in allocating land to various uses. A proposed state land-classification scheme for North Carolina, for example, instructs local governments to divide land into one of five different classes: developed, transition, community, rural, and conservation.³¹ Land classification is assumed to be a scientific or technical skill; but as a resource allocation technique, it is subject to the same problems identified by Hayek a generation ago. Planning is to be achieved not by leaving the ultimate decision to the people who are familiar with the circumstances of time and place but by attempting to communicate the pertinent knowledge to a central agency that makes the decision. Land classification contains no mechanism to utilize the dispersed bits of incomplete knowledge that all separate individuals possess about the demand and supply of land. The problem, as Sowell stresses, is one concerning the articulation of information:

It is not merely the enormous amount of data that exceeds the capacity of the human mind. Conceivably, this data might be stored in a computer with sufficient capacity. The real problem is that the knowledge needed is a knowledge of *subjective patterns of trade-off that are nowhere articulated*, not even to the individual himself. I might *think* that, if faced with the stark prospect of bankruptcy, I would rather sell my automobile than my furniture, or sacrifice the refrigerator rather than the stove, but unless and until such a moment comes, I will never *know* even my own tradeoffs, much less anybody else's.³²

Since land typically has more than one use, land classification is inherently arbitrary. There is no objective procedure by which the planner can classify each parcel of land into a particular land-use category when land use depends on subjective valuations of land. Moreover, the land-classification approach fails to take into account the fact that technical information—such as soil type, which is readily obtainable—is likely to be of trivial importance when compared with the information required to carry out the ordinary processes of economic activity—knowledge of the particular circumstances of time and place.

A major focus of recent land-use-planning efforts in rural areas has been the protection of agricultural land, but no explicit criteria or standards have been presented for determining how much or which land should be preserved. Vague and ambiguous language suggests that “naturally productive” agricultural land should be retained in agriculture “where alternative lands are available.”³³ This directive, however, glosses over the important unanswered (and perhaps unanswerable) questions: (1) What are naturally productive lands? and (2) When are alternative lands not available? Productivity is a matter of degree, not an either-or situation; and alternatives are always available at some price and at some location. Moreover, it is often the case that naturally productive agricultural land is even more productive in other uses. Apart from the price signals of the market process, no objective procedure has been discovered to determine the most economic amount of land to retain in agriculture—either now or in the future.

Problems Due to Time

Economic problems are always rooted in change, and in a dynamic economy any land use pattern will quickly become obsolete. How can one know apart from market signals whether more or less land should be in agriculture? The “public interest” is a popular criterion used in land-use planning, but the public interest is no more identifiable in land use than it is in other areas.³⁴ How, for example, would a landowner demonstrate that the conversion of agricultural land is in the public interest? All political decisions confer benefits on some people and impose losses on others, and there is no objective way to measure the benefits and costs.³⁵

This raises the question of whose interests should prevail in land-use decisions. A similar question was also raised in the economic calculation debate. Most of the proponents of market socialism assumed that the goal of a socialist economy was to provide for maximum satisfaction of private consumer demand.³⁶ However, the information that motivates choice by land market participants is decentralized and no third party can capture the constantly changing trade-offs. Thus, “when user monitoring, conveyed through prices and sales, is replaced by third-party articulation, in words or numbers, vast amounts of knowledge are lost in the process.”³⁷

A recent CAST report holds that there is no strong economic incentive for individuals to support farmland preservation policies because so much of the benefit is realized by future generations.³⁸ However, expected future benefits are reflected in current land prices. Consequently, the landowner is induced to use land (and other resources) in ways that reflect future as well as current demands. If, for

example, there is an increase in the expected future demand for agricultural land, the current price of such land will rise to reflect the expected change. Thus, in rationing land resources both at a given point in time and over time, the price system takes into account expectations of future demands of land in various uses. Since future benefits, costs, and discount rates are all uncertain, however, conservation and other land-use decisions are necessarily rooted in uncertainty. Thus, subjective entrepreneurial considerations are inevitably involved in analyzing the profitability of alternative patterns of land use.

In analyzing the issues related to preserving agricultural land, a recent study stresses major uncertainties about such factors as the future conversion of farmland to non-farm uses, possible long-run climate changes, future trends in agricultural productivity, and future water and energy supplies and costs. The study then concludes that "preserving farmland for the future is like buying an insurance policy for future contingencies."³⁹ There is an implication that central direction is required to preserve agricultural land in the presence of uncertainty. However, the presence of uncertainty does *not* imply that land-use decisions should be made by central direction and, in reality, all entrepreneurial decisions are rooted in uncertainty. The study cited fails to take into account how the market operates as a discovery process in selecting from among uncertain profitable alternatives and, hence, in promoting economic resource use. Indeed, the crucial role of entrepreneurship is to identify superior resource combinations and uses, taking into account expectations about the future.

Public-Choice Considerations

Two kinds of problems arise in non-market methods of allocating agricultural land (and other resources). In addition to information problems, public-choice theory suggests that, due to the *separation of authority and responsibility*, decision makers in the public sector often do not bear the full cost (or benefit) of the action taken.⁴⁰ Under public control, the entire community bears the costs and benefits associated with decisions made by central planners. The greater the area of land held in agriculture under administrative land-use controls, for example, the greater the cost imposed on potential users of land for other purposes—such as housing—as well as on current owners of agricultural land. Private entrepreneurs, by contrast, in choosing to own land and make land-use decisions, bear the costs and reap the benefits of their own entrepreneurial activity. For example, if the private entrepreneur mistakenly bids too much for agricultural land, he bears the cost. In the words of Mises the private decision maker is "subject to the incorruptible judgment of an unbribable tribunal: the account of profit and loss."⁴¹ Thus, although the market may misjudge the future, there is little reason to think that public officials can foresee it as well as market participants whose very livelihood depends upon actions based on future conditions.⁴² Regardless of whether the political decision makers are motivated by the "public interest," they are at a disadvantage

in obtaining the information necessary to achieve the most productive pattern of land use, due to the separation of power and knowledge.

Although public land-use planning to preserve agricultural land ostensibly is based on widespread citizen participation, the decisions are reached through a political process dominated by special interest groups. Lower income groups are disadvantaged by this process and "goals committees, citizens advisory boards and endless public hearings" only compound the extent of the disadvantage.⁴³ Administrative land-use controls also favor large landowners who are better able to handle the application processes and to obtain legal counsel and other advice.

Inflexibility of Land-Use Controls

Land-use patterns quickly become obsolete in a society characterized by rapid changes in science and technology. Discoveries and new ways of viewing factual information cannot be predicted. Ecology, energy, pollution, and world hunger are examples of issues, largely ignored only a decade or so ago, which have more recently significantly altered attitudes toward land use.

In much of the literature advocating land-use controls, there is an implicit assumption that government agents who devise and implement policies to correct for market failure "act solely to maximize social efficiency without regard to their own utility, power, prestige, income or vote appeal."⁴⁴ Political decision makers, like other people, however, are aware of their own interests, and self-interest is likely to be associated with "playing it safe." The political process, therefore, is short-run oriented, since the political decision maker's position and power are frequently determined by the results of the next election.⁴⁵ Consequently, the problem of adjusting land-use patterns to changing economic conditions becomes increasingly difficult as land-use decisions are centralized at higher levels of government. Regulations resulting from this process are likely to be restrictive, inflexible, and partial to established interests.

Land-use planners also tend to minimize the importance of change in efficient resource use.⁴⁶ This view varies dramatically with Hayek's view that rational economic calculation must take into account the constantly changing tastes and interests of all affected interacting individuals.

If we can agree that the economic problem of society is mainly one of rapid adaptation to changes in the particular circumstances of time and place, it would seem to follow that the ultimate decisions must be left to the people who are familiar with these circumstances, who know directly of the relevant changes and of the resources immediately available to meet them.⁴⁷

In summary, there is no known way in which the planner can determine the optimal amount of land in agriculture—either now or in the future. The demand for land for non-agricultural uses in a particular region depends, to a great extent, on domestic population growth. Yet, planners have not been notably successful in predicting population, age distribution, or areas of urban growth. The demand for U.S. agricultural output depends not only on domestic population growth but

also on foreign demand which is influenced by trade restrictions and other governmental policies. Even in estimating future government actions, however, the planner has no obvious advantage. Here, too, the most important source of uncertainty lies not in existing plans and policies but in future plans and policies. The periodic Congressional fight over farm legislation highlights the fact that policies developed through the political arena, whatever their other effects may be, create an important new source of uncertainty about U.S. agricultural production and land use.

Conclusions and Implications

The key issues of the economic calculation debate are closely related to problems inherent in land-use controls (including the protection of agricultural land). In recent CAST and NALS studies which conclude that market forces will not adequately protect agricultural land, there is little recognition of the information and knowledge problems that lie at the heart of all questions concerning the relative merits of the market versus central direction in resource allocation. Since there are only two ways of making land-use decisions, viz. through the market and through administrative land-use controls, the protection of agricultural land beyond the level dictated by market forces implies the substitution of centralized authority for decentralized market forces. Centralization of authority implicitly assumes that there is an objective procedure through which planners will be able to discover, announce, and enforce the socially correct pattern of land for all uses including agriculture. The history of economic regulation, including governmental attempts to "scientifically manage" natural resources, suggests that there are important limitations of this approach.

First, Hayek and Mises demonstrated that market prices are necessary for efficient resource use and that market socialism or marginal-cost pricing based on shadow prices is not a realistic alternative to the decentralized market. Sowell's recent work reinforces these conclusions as does a recent study by a proponent of socialist economics who, although discounting the importance of the Hayekian and Misesian insights from a theoretical standpoint, yet recognizes that it is an economic weakness of socialism that

so far no rational and workable pricing system has been devised. Prices do not fully reflect factor costs . . . and furthermore different criteria for price-setting are used for different categories of products. As a result, prices do not, and cannot, perform a rational allocative function.⁴⁸

Second, it is important to recognize political failure as an analogue of market failure. Conservation problems, externalities, and other imperfections in land use are frequently identified by comparing actual land markets against the "perfect market." Real-world land markets, however, will always appear to be inefficient if measured against a norm that assumes away uncertainty and information problems. Similarly, when government intervention is compared with that of an "ideal" polity, government failure is inevitable. Government intervention also encourages private firms to protect their interests through methods that produce more market

distortion.⁴⁹ Legislation to restrict the conversion of agricultural land to other uses, for example, generates countermeasures by landowners in the form of lobbying, hiring of lawyers to find loopholes, and so forth—all of which are likely to be as important in administrative land-use controls as in other areas of central direction.⁵⁰ The conclusion is that real-world land markets should be compared with real world administrative land-use controls.

What are the implications of this paper for economic analysis? Specifically, what is the role of the economist in achieving the pattern of land use which conforms most closely with the underlying supply and demand conditions? In the approach suggested by the preceding analysis, the primary task of the economist is *not* to determine the optimal pattern of land use on a local, state, or national basis. In attempting to do so, the economist is stymied by information problems similar to those discussed in the economic calculation debate. Emphasis should instead be placed on the effects of alternative frameworks of institutions and rules in accommodating the multitude of demands for land services.⁵¹ In land use, as in other policy areas, increased emphasis should be placed on political economy—on the principles of political and economic organization.⁵²

NOTES

1. National Agricultural Lands Study (NALS), *Where Have the Farmlands Gone?* (Washington, D.C.: Government Printing Office, 1979).
2. Gordon Bjork, *Life, Liberty and Property* (Lexington, Mass: D. C. Heath and Co., 1980).
3. Council for Agricultural Science and Technology (CAST), *Preserving Agricultural Land: Issues and Policy Alternatives*, Report No. 90 (Ames, Ia.: CAST, 1981); and Council for Agricultural Science and Technology (CAST), *Soil Erosion: Its Agricultural, Environmental, and Sociological Implications*, Report No. 92 (Ames, Ia.: CAST, 1982).
4. Ludwig von Mises, *Socialism: An Economic and Sociological Analysis*, reprint ed. (London: Jonathan Cape, 1951).
5. Whereas Mises denied the possibility of economic calculation in the absence of market prices, Hayek emphasized that the question at issue related to the possibility of *successful planning*. See F. A. Hayek, *Individualism and Economic Order* (Chicago: University of Chicago Press, 1948), p. 149.
6. Karen I. Vaughn, "Introduction" to T. J. B. Hoff, *Economic Calculation in the Socialist Society* (Indianapolis, Ind.: Liberty Press, 1981); and *idem*, "Economic Calculation Under Socialism: The Austrian Contribution," *Economic Inquiry* 18 (1980): 534-54.
7. This paper does not deal with externality problems. Many of the issues discussed, however, are also relevant in the analysis of land-use spillover problems. See E. C. Pasour, Jr., "Agricultural Land Protection: Is Government Intervention Warranted?" *Cato Journal* 3 (1982): 739-58.
8. The following summary of the debate relies heavily on two recent works by Karen Vaughn (see Note 6).
9. Ludwig von Mises, "Economic Calculation in the Socialist Commonwealth" (1920), in F. A. Hayek, ed., *Collectivist Economic Planning* (1933; reprint ed., Clifton, N.J.: Augustus M. Kelley, 1975). The ideas presented in this 1920 article were incorporated into his full-length study of socialism originally published in 1922 in German. The English translation, Mises, *Socialism: An Economic and Sociological Analysis*, was first published in 1936.
10. Abram Bergson, "The Politics of Socialist Efficiency," *American Economist* 24 (1979): 7.
11. Oscar Lange and F. M. Taylor, *On the Economic Theory of Socialism*, ed. Benjamin E. Lippincott (Minneapolis: University of Minnesota Press, 1938).
12. Richard A. Musgrave, "National Economic Planning: The U. S. Case," *American Economic Review* 64 (1974): 5.

13. Kenneth J. Arrow, "Limited Knowledge and Economic Analysis," *American Economic Review* 64 (1974): 5.
14. Lionel Robbins, *The Nature and Significance of Economic Science* (London: Macmillan, 1932).
15. See James M. Buchanan, *What Should Economists Do?* (Indianapolis: Liberty Press, 1979).
16. See James M. Buchanan and A. DiPietro, "Cognition, Choice and Entrepreneurship," *Southern Economic Journal* 46 (1980): 693-701.
17. "To assume all the knowledge to be given to a single mind in the same manner in which we assume it to be given to us as the explaining economists is to assume the problem away and to disregard everything that is important and significant in the real world" (Hayek, *Individualism and Economic Order*, p. 91).
18. Israel M. Kirzner, *Perception, Opportunity and Profit* (Chicago: University of Chicago Press, 1979).
19. Israel M. Kirzner, *Competition and Entrepreneurship* (Chicago: University of Chicago Press, 1973).
20. W. J. Baumol, *Economic Theory and Operations Analysis*, 4th ed. (Englewood Cliffs, N. J.: Prentice-Hall, 1977), p. 512. "The socialism by price guidance proposal has come to be known by one of its characteristics, *marginal cost pricing*. Every firm would be forced to sell as much as it produced and to sell this output at a price equal to its marginal cost" (*ibid.*). Marginal-cost pricing is an inherent feature of Lange's "market socialism." It is also widely discussed as a regulatory solution in the control of "natural monopolies." In both cases, marginal-cost pricing assumes away information problems.
21. Hayek, *Individualism and Economic Order*.
22. *Ibid.*, pp. 77-78.
23. Jack Hirshleifer, *Price Theory and Applications*, 2nd ed. (Englewood Cliffs, N.J.: Prentice-Hall, 1980).
24. E. C. Pasour, Jr., "Economic Efficiency and Inefficient Economics: Another View," *Journal of Post-Keynesian Economics* 4 (1982): 454-59.
25. See Arrow, "Limited Knowledge and Economic Analysis"; and Hayek, *Individualism and Economic Order*.
26. Robert H. Nelson, *Zoning and Property Rights* (Cambridge, Mass: MIT Press, 1977).
27. "Although years of effort and large public expenditures have been devoted to the preparation of plans, very few of them have ever been followed. The current optimism that there will be improvements in this respect in all likelihood only mirrors similar expectations for improvement in the past. The chronic failures of land-use planning efforts are strong evidence that there has been something fundamentally missing in the thinking on which these efforts have been based" (*ibid.*, p. 192).
28. Robert H. Nelson, "Making Sense of the Sagebrush Rebellion: A Long-Term Strategy for the Public Lands" (paper presented at the Third Annual Conference of the Association for Public Policy Analysis and Management, Washington, D. C., October 23-25, 1981).
29. *Ibid.*
30. Hayek, *Individualism and Economic Order*, p. 83.
31. N. C. Land Policy Council (NCLPC), *A Land Resources Program for North Carolina* (Raleigh, N. C.: NCLPC, 1976).
32. Thomas Sowell, *Knowledge and Decisions* (New York: Basic Books, 1980), pp. 217-18.
33. N. C. Land Policy Council, *A Land Resources Program*, pp. 2-3.
34. Barry Bracewell-Milnes, "Market Control Over Land-Use Planning," *Government and the Land* (London: Institute of Economic Affairs, 1974).
35. "Of course . . . we do make comparisons between the satisfaction of different people . . . whenever we discuss distributional questions, we make our own estimates of the happiness afforded or the misery endured by different persons or groups of persons. But these are our estimates. There is no objective measurement conceivable" (Lionel Robbins, "Economics and Political Economy," *American Economic Review* 71 [1981]: 5).
36. Vaughn, "Introduction" to Hoff, *Economic Calculation*.
37. Sowell, *Knowledge and Decisions*, p. 216.
38. Council for Agricultural Science and Technology, *Preserving Agricultural Land*, p. 18.
39. *Ibid.*, p. 1.

40. John A. Baden and Richard L. Stroup, "The Environmental Costs of Governmental Action," *Policy Review* 4 (1978): 23-26.
41. Ludwig von Mises, *Bureaucracy* (New Rochelle, N. Y.: Arlington House, 1969), p. 35.
42. Pierre R. Crosson and R. B. Haas, "Agricultural Land," chap. 8, *Current Issues in Natural Resource Policy*, Paul R. Portney, ed. (Washington, D. C.: Resources for the Future, 1982), p. 269.
43. David E. Ervin, et al., *Land Use Control: Evaluating Economic and Political Effects* (Cambridge, Mass.: Ballinger, 1977), p. 52.
44. John Burton, "Externalities, Property Rights and Public Policy: Private Property Rights or the Spoliation of Nature," *Epilogue*, in Steven N. S. Cheung, *The Myth of Social Cost* (London: Institute of Economic Affairs, 1978), p. 81.
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