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RONALD COASE AS A SCIENTIFIC REALIST

by

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and Business**

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## RONALD COASE AS A SCIENTIFIC REALIST<sup>1</sup>

### I. INTRODUCTION

It is possible that more words have been written about than have been written by Ronald Coase. Many of his contributions have continued to have substantial influence long after their initial publication. Steven Cheung (1983) has suggested that this influence has grown exponentially with time but this is true only of his two most famous essays (See Table 1). Coase attributes much of the controversy surrounding his writing to his difficulty in putting his ideas into words. [The thesis of this paper is that one of the contributing factors to the polemical reaction to many of Coase's papers arises from his views on the methodology of economics. I will argue that Coase's views conform closely to scientific realism and that a scientific realist faces a daunting task in addressing the predominantly instrumentalist and logical positivist audience in the economics profession in the late twentieth century.]

### II. REALISM

Scientific realism is an epistemological doctrine and a theory of knowledge. It offers an explanation for the success of scientific inquiry, and therefore is in some respects a positive theory. It also contains normative elements, however. The semantic dimensions of scientific realism, particularly the emphasis on a correspondence between theoretical entities and real entities in the world, have been emphasized by many writers. In some contexts, this correspondence has been used to describe the actual belief system of actual scientists. In other contexts, this correspondence is articulated as an ideal. Scientific realism also addresses the motivation of researchers. Scientific realists frequently state that scientists intend their theories and models to be true representations of real phenomena.

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<sup>1</sup> The research assistance of Bill Deen, Linda Cousineau and Al Mussel is gratefully acknowledged.

Scientific realism is an old theory of knowledge which has recently experienced a renaissance among methodologists.<sup>2</sup> The content of scientific realism can be summarized in five propositions; Independence, Apprehension, Reference, Linearity and Truthfulness.

### Independence

Phenomena in the world are held to be independent of consciousness of the investigator. Things have real existence. According to Bhaskar (1975, p. 27)

"if there were no science, this would still be a nature, and it is this nature which is investigated by science"

Independence implies that the agenda for scientific inquiry is set, ultimately, by phenomena. Assessment of a scientific theory should be based on the degree to which that theory explicates the nature of the phenomena. The independence proposition does not necessarily rule out the study of hypothetical situations as an expositional aid or as part of the process of deduction, but scientific realist views on independence and reference require a clear link between the investigation of hypothetical cases and the phenomena being analysed.

### Apprehension

Reality, in its independent existence, can be perceived and understood by the patient and clever investigator. Feyerabend maintains that scientific inquiry is in fact the best available means to explore and understand the world. He offers this proposition without argument. Apprehension is not unique to scientific realism. Instrumentalists who seek only useful predictions from theories must also maintain that investigators can perceive and understand what is being predicted.

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<sup>2</sup> The interested reader is referred to Perry (1912), Evans (1928), Sellars (1966), Feyerabend (1981), Hooker (1987), Bhaskar (1975) and Boyd (1983).

### Reference

The semantic content of scientific realism is one of its most emphasized elements. According to Hooker, the reference thesis asserts that

if a scientific theory is in fact true, then there is in the world exactly those entities which the theory says there is, having exactly these characteristics which the terms of the theory describe them as having.

Elements of a theory refer to real entities which have independent existence. Reference therefore combines the ideas of independence of phenomena and the relevance of truthfulness in the appraisal of theory. It also provides guidance for the practice of scientific inquiry. Efforts to eliminate non-referential elements from existing theories are viewed as progressive.

### Linearity

Scientific realism offers an explanation of the progress and apparent success of scientific inquiry. This progress is characterized as sequential and linear. New theories build on old theories. Old theories turn out to be limiting cases of new theories, so that new theories, in addition to explaining and predicting phenomena, explain the shortcomings of old theories. Progress in science consists of successively more accurate approximations of real processes, structures or phenomena. Boyd has suggested that this progress may in fact take place dialectically, rather than smoothly. A corollary of the linearity hypothesis is that concepts and terms can be compared across paradigms and over the schisms of scientific revolutions, in contrast to Kuhn who rejected the possibility of semantic continuity of this type.

### Truthfulness

Scientific realism affirms, often implicitly, that truthfulness is an appropriate criterion for the appraisal of theory. This is an important point to emphasize in discussions of the methodology of

economics, which has been influenced by an instrumentalist view that truthfulness of a theory is irrelevant or impossible to assess and that "usefulness" is a more appropriate standard (Friedman, Lucas, McCloskey).

Hooker admits that there can be no independent validation of truthfulness, that no actual theory can be known to be true, but that theories are nevertheless intended to be true representations. Present theories should therefore be treated with an attitude of skepticism. The truthfulness criterion embodies a motivational aspect of scientific realism. Feyerabend concludes that many prominent natural scientists, including Einstein, expressed this motivation in their writings on methodology.

In emphasizing the role of theory as explanation of real phenomena, scientific realism embraces a brand of essentialism. This is particularly evident in Feyerabend's discussion.

It is not the aim of this essay to offer an appraisal of the validity of scientific realism<sup>3</sup>. Nevertheless, an overview of some of the arguments for and against this theory of knowledge is helpful. Proponents of scientific realism frequently claim that, as Putnam said, "it is only philosophy that doesn't make the success of science a miracle" (quoted in Laudan). If scientific theories were not at least approximately true and becoming closer in their approximation to truth, what amounts for contribution of scientific discovery to technological advance? Of course, this argument is not definitive. It merely challenges opponents to develop a better alternative. Perhaps one day they will. Scientific realism clearly contradicts Kuhn's view on the non-comparability of terms across paradigms and the instrumentalists' rejection of truthfulness in theory appraisal. Laudan suggests that there is vagueness and a certain logical circularity in scientific realism, but his critique ends with

All of us would like realism to be true; we would like to think that science works because it has got a grip on how things really are. But such claims have yet to be made out. Given the present status of this act, it can only be wish fulfilment that gives rise to the claim that realism, and realism alone, explains why science works.

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<sup>3</sup> Boyd (1983) and Laudan (1981) provide an introduction.

Scientific realism would appear to face formidable obstacles as a theory of economic epistemology. The subjective theory of value and the participant observer affect blur the distinction between human consciousness and independent phenomena. Radical subjectivists such as Lachmann argue that there are no underlying independent economic realities. Perception is reality. The participant observer effect can occur in several ways. If an economist discovers a way to forecast prices and acts on the basis of that knowledge, the theory embodied in the forecast may be rendered invalid, even though it may have been a truthful representation of actual processes and structures before the investigator acted. The problem of observational equivalence, discussed at length by Boyd with reference to the natural sciences, is a hallmark of work in the New Classical Macroeconomics tradition. How are two observationally equivalent theories to be assessed as representations of a presumably unitary independent real phenomenon?

The linearity hypothesis would appear to be contradicted by the history of thought in economics. As Blaug has observed, old economic theories never seem to die. There seems, for example, to be a Kondratieff wave of Kondratieff wave theories (see Marshall and Fox). As Lavoie has observed, both sides of the famous "Socialist Calculation Debate" of the 1920's and 1930's continue to claim victory; often appealing to the same data. Lavoie, however, provides corroboration of the position that translation of terms across paradigms, while problematical, can be achieved.

### **III. REALISM IN THE METHODOLOGY OF ECONOMICS**

Realism as an epistemological and methodological doctrine has suffered alternately from neglect and abuse by economists. To the extent that "realism" is discussed by economic theorists or economic methodologists, all too often the emphasis is on a recapitulation of the "realism of assumptions" debate in the 1940s and 1950s and on Friedman's famous essay on the subject. It is hardly surprising, given this context, that many economists look awry at arguments being made from

a scientific realist perspective.

Machlup is typical of the views on realism held by economists at mid-century. He views realism and abstraction as two ends of a continuum related to the characteristics of a model. To Machlup, realism is synonymous with cluttering up a model with irrelevant details. In his words, "people who are superficial who prefer to 'look' rather than to 'think' and are more interested in the outer trappings than in the inner workings of things are wont to complain about models that are 'unrealistic' (page 78). Machlup also suggests that realism and relevance are incompatible ends in the development of economic theory (page 187).

Blaug, in his five chapter overview of the methodology of economics does not mention scientific realism. His references to "realism" are in the context of the realism of assumptions debate and reaction to Friedman's essay. McCloskey does not address scientific realism in either his book or in his influential paper. In an exchange with Maki, however, McCloskey claims to be a realist and argues that his study of the rhetoric of economics is an expression of scientific realism. Maki's response to McCloskey conveys scepticism regarding the relationship between McCloskey's position and scientific realism. Part of the problem is that McCloskey doesn't actually say what he means by realism. Lawrence Boland is also silent on the subject of scientific realism. He does address the "realism of assumptions" debate but like many other economic methodologists fails to distinguish between realism of assumptions and realism as a methodological position. Kiant also does not discuss scientific realism.

Hausmann does discuss scientific realism and explores its relationship to the methodology of economics (Hausmann, 1984, Introduction and 1992, Appendix). He maintains that scientific realism and instrumentalism are the two main schools of thought among philosophers of science regarding the goals of science. According to Hausmann, scientific realists maintain that science should help us discover new truths about the world and to explain in addition to enabling us to make successful

predictions. Hausmann's discussion acknowledges that while realism maintains that theories are true representations of real objects and phenomena, that the state of human knowledge at a point in time is subject to error and that theories as a consequence are subject to revision and correction.

Caldwell (1982) argues that most contemporary philosophers of science have adopted some view of scientific realism. He fails to address the obvious question of why the views of scientific realism have had such limited impact on the thinking of methodologists of economics. Much of his discussion of realism dwells on the use of the term popularized by Friedman's essay. Nevertheless, Caldwell and Hausmann represent the high water mark for discussions of scientific realism among the methodologists of economics, at least until the publication of Maki's papers.

Maki has done a great deal to refocus economists thinking on the subject of realism. In his view, the so-called realism of assumptions debate was misnamed. At issue was the function and purpose of abstraction in economic theory. Maki characterizes this as the "realisticness" of assumptions but semantic confusion might be reduced if the more traditional categories of abstraction versus concreteness were maintained. At issue then, in the infamous debate in the 1940s and 1950s, was the proper level of abstractness versus concreteness in the assumptions used in economic models and economic analysis. Maki has identified realist themes in the work of Menger and certain members of the Austrian School, including Israel Kirzner, as well as in the work of Herbert A. Simon.

Scientific realism needs to be seen as an alternative to and not necessarily compatible with the more familiar doctrines of logical positivism and instrumentalism which characterize much of current thinking on methodology by economists. Clouded by the regrettable legacy of the realism of assumptions debate, discussions of scientific realism frequently sound archaic to modern economists. Recent work by philosophers of science on the appraisal and evolution of the ideas of scientific realism have been taken up relatively slowly by economists. Nevertheless, as Maki has shown, scientific realism has been an important theme in the work of some economists even though the ideas

of realism have not been made explicit. It is my contention that Ronald Coase has pursued a largely realist research agenda and that his writings reflect this pursuit in heretofore unappreciated ways.

#### **IV. REALIST THEMES IN THE ECONOMICS OF RONALD COASE**

On more than one occasion, Coase has denied any claim to authority as a methodologist. In his 1982 Nutter lecture, he protests

I should add that I am in no sense well informed in the philosophy of science. Words like epistemology do not come tripping from my tongue.

Nevertheless, Coase speaks on the subject of methodology often. In the first chapter of The Firm, the Market and the Law, Coase writes

(it) would seem to imply that most economists have a different way of looking at economic problems and do not share my conception of the nature of our subject.

Characterization of the nature and purpose of inquiry of a particular field is clearly a question of methodology, and Coase sees himself as a dissenting voice. In particular, he proceeds to question the fruitfulness of following Robbin's notion that economics is the study of allocation of limited means among competing ends. Adherence to this definition has contributed to emphasis on the formal logic of optimization and choice, but "has nevertheless had, in my view, serious adverse effects on economics itself" (Coase, 1988, p.3). The deficiency has been the neglect of the study of the agents and institutional settings in which choice, including exchange, takes place. By suggesting that economics may be more than the formal logic of optimization, Coase shows some sympathy for Buchanan (1964), but more important in the present context, he reveals himself as a closet methodologist. Several of Coase's most influential and controversial papers use realist arguments. His own exposition of the meaning and significance of his own work is clearly in the scientific realist tradition. Coase is often sharply critical of the state of economic theory and of the mental habits of economists. In this tradition, Coase repeatedly emphasizes three principles that have not been respected in economic research. First, theory is subservient to phenomena. The so-called real world

is not a special case. Second, he repeatedly emphasizes the need for economists to study the action of actual agents in the context of existing institutions as part of the generation and validation of theory. Finally, Coasian Methodology erases the traditional and revered distinction (see Leijonhufud) between "theoretical" and "applied" research.

The most obviously realist element is Coase's insistence on the reference of theoretical terms. This reference is combined with an emphasis on the independent existence of phenomena. Firms exist. Transactions costs exist. Lighthouses exist. Markets exist. Independent existence of phenomena is behind the entreaty to investigate the nature of those real entities identified as elements in theories. It also motivates the proposition that the existence of real entities, (transactions costs) should influence the configuration of theoretical analysis (welfare economics).

Coase's contributions to economic theory focus on public utility pricing and management, welfare economics and law and economics. In this last area, his work has emphasized the relationships between legal rights and exchange. Reference serves as a unifying theme of contributions in each of these areas. Much of Coase's criticism of economic theory derives from concern for reference. Some examples of this critique include

The rational utility maximizer bears no resemblance to the man on the Clapham bus or, indeed, to any man (or woman) on any bus. There is no reason to suppose that most human beings are engaged in maximizing anything unless it be unhappiness, and even this with incomplete success. (1988, p.3)

regarding "The Problem of Social Cost"

What my argument does suggest is the need to introduce positive transactions costs explicitly into economic analysis so that we can study the world that exists. This has not been the effect of my article. (1988, p.15)

regarding the analysis of external affects inherited from Pigou

..he did not make any detailed studies of the working of economic institutions...the situation in which sparks from a railway locomotive could start fires which burnt woods on land adjoining the railway without the railway having to pay compensation to the owners of the woods..had come about not because of lack of governmental action but in consequence of it.

Modern economists, in the main, use the same approach as Pigou, although with some change in terminology and even greater detachment from the real world. (1988, p.22,23)

Finally, from his 1982 Nutter Lecture,

..most of us would not value the theory if we did not think these implications corresponded to happenings in the real economic system..

..Realism in assumptions forces us to analyze the world that exists not some imaginary world that does not.

Reference also motivated "The Nature of the Firm" in which Coase hopes to show "that a definition of a firm may be obtained which is not only realistic in that it corresponds to what is meant by a firm in the real world, but is tractable." The need for such a definition derives from Coase's characterization of the purpose for an economic theory of the firm. This purpose is to provide answers to three questions;

- i) Why do firms exist?
- ii) What determines the number of firms?
- iii) What determines what firms do? (eg. what inputs they buy and what outputs they sell)

which are not the central questions addressed by the theory of production in contemporary microeconomics (see Machlup, Chapter 16, and Henderson and Quandt, Chapter 4).

According to Coase, the firm is an organization in which market transactions are replaced by entrepreneurial direction and in which production is undertaken. The distinguishing mark of the firm is the suppression of the price mechanism in favour of direct coordination. The explanation for the existence of firms focuses on transactions costs. The size of a firm is determined by balancing the costs of transacting against the costs of entrepreneurial direction. The cost of entrepreneurial direction include failures by entrepreneurs to direct factors of production to their most productive employment. Having offered this explanation and definition of the economic institution the firm, Coase proceeds to ascertain "whether the concept of the firm which has been developed fits in with that existing in the real world". He proceeds to an analysis of legal aspects of employer/employee relationships and a study of contractual relations in firms.

Why is this scientific realism? First, the institutions called firms are treated as having real and independent existence. The purpose of the theory articulated by Coase is to explain the emergence and evolution of these institutions. Secondly, terms used in the theory are referential. There is a correspondence between the language of the theory and the known institutions described as firms which have existence in the real world. Throughout the paper, truthfulness is used as a meaningful and relevant criterion for the appraisal of theory. In addition, even the title of the paper reflects a brand of essentialism which is frequently characteristic of scientific realism.

Coase's early work on the hog cycle with R.F. Fowler (1935a, 1935b, 1937, 1940) also exhibits themes of scientific realism. The contemporary reader might be put off by the painstaking study of the actual technology, management and biology of hog production which is undertaken in these papers. Commitment to the study of actual phenomena leads Coase and Fowler to question whether it is correct to describe historical fluctuations in hog prices and production as being a "cycle" at all, given that the data exhibit neither a constant period nor amplitude. It is clearly consistent with scientific realism that the final paper in this series, which addresses the general problem of a theory of producer expectations, is the culmination of the study of a particular existing situation. Elements in the theory of producers expectations are intended to be referential.

Coase and Fowler affirm the truthfulness thesis of scientific realism as well. They repeatedly indicate the need for verification of a theory, making them at the very least anti-instrumentalists. Their assessment of the cobweb model as an explanation of the U.K. hog cycle is more telling. Their rejection of that model is clearly based on a test of the model's assumptions regarding producers' expectations. They argue that the assumption of constant expectations on the part of producers is at variance with objective observations of phenomena and conclude that the model therefore cannot be offered as an explanation of cyclical variations in prices and production.

"The Marginal Cost Controversy" (1946) constitutes a critique of the Hotelling and Lerner

model of optimal pricing under decreasing average costs. The standard solution for efficient pricing under such a regime is to choose output so as to equate price and marginal cost and then to use tax revenues to subsidize the difference between average cost and price on that optimal output. Coase's critique draws on a number of realist themes. He insists on examining the nature of actual phenomena as opposed to the formal properties of hypothetical situations. The second section of the paper begins

Any actual economic situation is complex and a single economic problem does not exist in isolation. Consequently, confusion is liable to result because economists dealing with an actual situation are attempting to solve several problems at once. I believe this is true of the question I am discussing in this article. The central problem relates to a divergence between average and marginal costs. But in any actual case two other problems usually arise.

This brief portion of text emphasizes both the independence of the existence of economic phenomena and the necessity of the examination of actual economic situations. Unravelling complex economic phenomena leads Coase to the argument for multi-part pricing as a solution to situations apparently characterized by decreasing average costs.

"The Federal Communications Commission" (1959), like his later contribution "The Lighthouse in Economics", shows Coase's commitment to the careful examination of actual situations as the raw material of theoretical insights. It was in this paper that Coase began to develop the relationship between transactions costs and property rights as a factor contributing to market failures which he was to develop more fully in "The Problem of Social Cost". A careful review of technical and policy documents from the beginning of the century is used to illustrate the conventional wisdom, as of 1959 at least, that broadcasting was either a natural monopoly or an activity which of necessity had to be provided by the state. Quoting Siepmann,

Private enterprise, over seven long years, failed to set its own house in order. Cut throat competition at once retarded radio's orderly development and subjected listeners to intolerable strain and inconvenience (1950).

Coase continues in his essentialist bent by claiming that the views of Siepmann were based on a

misunderstanding of the nature of the problems involved in broadcasting. Rather than concluding that broadcasting is inevitably a natural monopoly or a service which could only be provided by the state, Coase suggests that the cause of the problem is that property rights in radio frequencies were prevented from emerging. As in "The Marginal Cost Controversy", Coase elects to examine the problems of natural monopoly and public provision of services by carefully examining an actual case in an effort to uncover the underlying factors which create a situation which cannot be addressed by voluntary exchange in markets.

In what is arguably his most famous paper, "The Problem of Social Cost" (1960) and in the companion piece "Notes on the Problem of Social Cost" (1988), Coase adopts his strongest scientific realist position. This study addresses the nature, origin and consequences of actions undertaken by business firms which have non-contractual, non-pecuniary effects on other parties. Throughout the paper, the concept of the firm is clearly referential. Extending the notion of transactions costs introduced in "The Nature of the Firm", Coase argues that these costs exist and have real effects on the outcomes of contractual and exchange relations. Throughout the paper, the need to understand actual situations and the use of theory as a tool in obtaining understanding of actual situations is reemphasized. For example,

Satisfactory views on policy can only come from a patient study of how, in practice, the market, firms and governments handle the problem of external effects ...

... The problem is to define practical arrangements which will correct defects in one part of the system without creating more serious harm in other parts.

... Start our analysis with a situation approximating that which actually exists ...

In "Notes on the Problem of Social Cost" Coase (1988, Ch. 6) argues that it is precisely the real existence of transactions costs and the real consequences of those costs which represents the point of departure for his study of external effects from work in the tradition of Pigou. He characterizes modern economic theory as relating to a world of zero transactions costs. This is seen as a fatal

limitation

..In an economic theory which assumes that transactions costs are nonexistent, markets have no functions to perform..

and

What my argument does suggest is the need to introduce positive transactions costs into the analysis so that we can study the world that exists."

The assumption of zero transactions costs is incompatible with the persistent existence of unrealized gains from exchange which enduring externalities represent.<sup>4</sup> Coase offers a scientific realist critique of modern welfare and environmental economics. Coase makes some effort to distance himself from the so-called "Coase Theorem" in his "Notes". One gets the impression that Coase regrets the extended and at times animated discussions which followed the publication of the paper, and that much of this discussion has reduced the impact of what Coase really intended us to understand from "The Problem of Social Cost".

"The Lighthouse in Economics" (1974), concludes by asking how so many great economists could have been so wrong for so long regarding the characterization of the nature of services from lighthouses as an example of a so-called public good. As in the case of "the Federal Communications Commission", Coase, motivated by the writings of Mill, Sidgwick, Pigou and Samuelson, examined the origins and evolution of the lighthouse industry in Britain. The purpose of this examination was to consider whether this industry was subject to the types of incentive problems described in economics textbooks. Prior to Coase, no economist had made a careful study of the actual operation of the lighthouse industry. In "The Lighthouse", "lighthouses" are referential. By showing that lighthouses came into existence and operated successfully on a sound financial basis, Coase demonstrates that when "the lighthouse is simply plucked out of the air to serve as an illustration" abstract economic analysis takes on a misleading veneer of concreteness and can lead economists to see problems which

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<sup>4</sup> See Cheung (1978) for further development of this point.

do not in fact exist. For example, using historical records, Coase was able to find examples in which entrepreneurs were able to make more than a reasonable living in the provision of lighthouse services. Coase concludes his critique of the conventional treatment of lighthouses by saying

such generalizations are not likely to be helpful unless they are derived from studies of how such activities are actually carried out within different institutional frameworks.

This type of investigation has been a hallmark of Coase's published work. This emphasis began with his early studies of the hog cycle in Britain (Coase and Fowler, 1935a, 1935b, 1937, 1940), and continued with several essays on the economic interpretation of financial statements for corporations (Coase et al., 1938a, 1938b, 1940). His studies of broadcasting (Coase, 1947, 1948, 1950a, 1950b, 1954, 1962, 1965, 1979) electric utilities (Coase, 1950) and the postal service (Coase, 1939, 1955, 1961) as well as his investigation of the economics of advertising (Coase, 1974, 1977) extended this tradition. Coase's contributions to economic theory in the areas of utility pricing (Coase, 1945, 1946, 1947a, 1947b, 1966, 1970, 1972) and his introduction of the concept of transactions costs (Coase, 1937, 1959, 1960) grew out of these investigations of particular real situations. According to Landes et al. (1983), he also encouraged colleagues at the University of Chicago and contributes to the Journal of Law and Economics to study how "markets actually worked". The steadfast insistence that pig producers, firms, transactions costs, laws, state-owned enterprises and lighthouses exist and that an important goal of economic research is contributed to human apprehension of the nature and significance of that existence exemplifies a scientific realist approach to economic inquiry.

In the brief essay "Marshall or Method", Coase describes Marshall's belief that economists should not study "imaginary problems not conforming to the conditions of real life" with much sympathy. His tone in posing the rhetorical question "Do we concern ourselves not with puzzles presented by the real economic world but with the puzzles presented by other economists' analysis?" indicates that he would answer in the affirmative, and this is, in spite of his disclaimer, an indictment of the practice of the economics profession.

Coase's position on the linearity thesis of scientific realism is at best equivocal. Linearity offers an explanation of the success of science. Professor Coase is loath to acknowledge much success in contemporary economics. According to Dingle, Coase feels that no contemporary book on economics will be remembered in 50 years. He frequently despairs in The Firm, the Market and the Law of the limited and generally unproductive influence that "The Nature of the Firm" and "On the Problem of Social Cost" have had on the economics profession. The apparent difficulty in absorbing the concept of transactions costs into modern price theory contradicts the idea of new theories being built on old ones. There is, nevertheless, some evidence of the linearity thesis in some of Coase's work. In "The Lighthouse" and "Social Cost" he takes pains to trace the intellectual roots of his analysis. In each of these contributions, however, his intent is to illuminate error and inconsistency in the received view. This is consistent with Boyd's dialectical characterization of linearity, but given Coase's frequent expressions of frustration with the state of contemporary economic theory, it is difficult to conclude that he sees much movement along the vector of progress.

## V. CONCLUSIONS

Throughout his published work, Coase has consistently treated economic phenomena as having independent real existence. He has treated elements of economic theory, such as "firms", as referential. When real phenomena, such as transaction costs, are conspicuous by their absence from economic theory, Coase, as a scientific realist, calls for their incorporation into theory.

Blaug considers Popperian falsificationism to be the mainstream view of methodology among economists. Friedman's position, which Boland has described as instrumentalism, has also been influential. Many economists have adopted a not necessarily consistent combination of falsificationist and instrumentalist views of methodology. This synthesis is incompatible with the fundamental propositions of scientific realism. In the prevailing atmosphere in the economics profession which

places low value on questions of methodology, the attitudes and activities of scientific realist economists are inscrutable to the uninitiated. Coase has been controversial, not because he has had difficulty in putting his ideas into words, but because his views on the methodology of economics represent a minority view.

Ronald Coase's contributions to economic theory and policy constitute a slim but weighty volume. Many of his papers do not fit comfortably into familiar categories of economic theory. In many instances he has created new categories and concepts which have spawned entire new research programs. The contention of this paper is that Coase's methodological position corresponds closely with the views of scientific realism. If accepted, this thesis would add Coase's name to a small but growing list of scientific realist economists being compiled by methodological reconstructionists such as Maki. As Caldwell has suggested, scientific realism is attracting increasing attention and support among philosophers of science. It would appear that certain economists, while not identifying themselves formally as scientific realists may be like Molière, when he said "For more than forty years I have been speaking prose without knowing it".

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Table 1  
Citation Counts of Selected Articles by Ronald Coase  
1956-1990

Article	1956-1965	1966-1970	1971-1975	1976-1980	1981-1985	1986-1990
The Nature of the Firm (1937)	15	16	47	114	212	346
The Marginal Cost Controversy (1946)	3	5	8	5	12	13
The Federal Communications Commission (1959)	20	26	33	35	37	43
The Problem of Social Cost (1960)	17	88	241	347	566	451
The Independent Radio Advisory Committee (1962)	0	13	2	3	2	2
The Theory of Public Utility Pricing and Its Application (1970)	-	0	19	10	4	2
Durability and Monopoly (1972)	-	-	5	12	13	44
The Lighthouse in Economics (1974)	-	-	3	12	17	27
The Market for Goods and the Market for Ideas (1974)	-	-	1	14	10	12
Advertising and Free Speech (1977)	-	-	-	14	6	15
The Coase Theorem and the Empty Core: Comment (1981)	-	-	-	-	8	21

Source: Social Sciences Citation Index.