Environmental Economics: The Meaning of an 'Objective' Policy Science

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ABSTRACT

Environmental economics is a policy science. Environmental economists, however, find that their policy recommendations are often neglected by political officials. Some of them react to this neglect by reproaching public authorities with lack of efficiency: this so-called inefficiency is considered to be a manifestation of government failure. Others propose a redefinition of environmental economics in order to make it fit better with actual political objectives. After briefly outlining the case for an economic paradigm that differs from conventional (i.e. neo-classical welfare) environmental economics, I argue that an alternative paradigm demands a different interpretation of economic 'objectivity'. I claim that economic 'objectivity' ultimately comes down to a non-neutral common consent within a particular community of economic scientists. This interpretation leaves room for a multiplicity of 'objective', but non-neutral economic theories. The fact that the inevitable value ideas underlying a particular theory cannot be made fully transparent, urges us to accept a different conception of the theory's political relevance. Environmental economic theory should be considered not so much a provider of political 'instruments', as of scientific 'insights'. It should not simply be considered a theory that responds to actual political objectives, but one that inspires political objectives. These two latter suggestions of mine are only preliminary recommendations, which require further conceptual analysis.

KEYWORDS

Bromley, neutrality, objectivity, Pearce

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1. INTRODUCTION

Most economists understand environmental economics as a policy science. It is meant to provide public authorities with scientific knowledge regarding possible solutions for environmental problems. Very often, however, environmental economists find that public authorities pay no heed to their scientific recommendations. They usually react to this political neglect by blaming public authorities for lack of (allocative) efficiency. Political neglect of economists' recommendations is very often considered a manifestation of 'government failure' (rather than 'market failure'). In this paper I shall argue that environmental economists could – in a certain sense – extend their political influence. This extension would result from a different interpretation of the subject matter of environmental economics; but this alternative definition of the subject matter will not get a chance within the community of economic scientists as long as economists hold on to their orthodox interpretation of economic objectivity. After briefly outlining the need for an extended subject matter of environmental economics, therefore, I shall deal extensively with the conventional interpretation of economic objectivity. I shall indicate that other interpretations are possible, which better respect the nature of political processes and, consequently, allow for a greater political influence.

I will base my analysis of the conventional interpretation of objectivity on the writings of David Pearce, who can be considered a prominent representative of conventional environmental economics. The writings of Daniel Bromley, a prominent representative of an institutional approach to environmental problems, illustrate that at least one other definition of the subject matter of environmental economics and of economic objectivity is possible. In order to clarify the concept of economic objectivity, Max Weber, both philosopher and economist living at the beginning of our century, will be my main source for a conceptual analysis.

2. A BRIEF CASE FOR EXTENDING THE SUBJECT MATTER OF ENVIRONMENTAL ECONOMICS

Environmental economists' policy recommendations often take the form of institutional adaptations. They propose legal measures to adapt or transform the existing institutional organisation of an economy. Economists plead, for instance, for the introduction of taxes, tradable permits, subsidies, new property rights. These institutional adaptations are meant to correct – directly or indirectly, and successfully or not – the ecological performance of economic activities. The problem with the proposed kind of institutional adaptations, however, is that they arise from an economic paradigm that considers the

institutional context of economic activities as given. Conventional economics thus cannot offer us insights into the relationships between the existing institutional organisation of an economy and its ecological performance. Consequently, environmental economics cannot guarantee that the proposed institutional adaptations are more than ad hoc solutions dealing with symptoms of, rather than with institutional reasons for, environmental degradation. Indeed, despite all environmental efforts, whether market-based or not, the so-called 'roundaboutness' of economic production processes (i.e., the organisational distance between primary resources and final products) and the circulation velocities of most commodities are not diminishing. These tendencies are accompanied by a continuously, although now more moderately, rising need for energy in economic production processes (and in households). Moreover, some environmental problems can be reduced only by worsening others: for instance, environmental measures to promote the recycling of 'waste' material themselves require additional energy, and this increased energy use is accompanied by a rising level of CO_2 emissions. Consequently, insights into the ecological performance of existing economies – that is, into the institutional reasons for an economy's ecological problems – are needed to solve environmental problems more effectively. This requires extending the subject matter of environmental economics to include the institutional organisation of an economy as a relevant factor in economic performance.

As well as the ecological perspective, the political perspective also invites us to extend the subject matter of environmental economics to include the institutional organisation of existing economies. As Bromley explains so well in his writings (see, for instance, Bromley 1991, chapter 10), in their search for solutions to environmental problems, citizens and professional politicians do not look so much for 'efficient' (i.e., Pareto-optimal) solutions within the existing institutional context, as for an 'efficient' transformation of existing institutions – that is, an institutional transformation which meets the wide variety of political objectives (of which Pareto-optimality is, at most, but one). The definition of environmental problems – and of what the citizenry considers to be adequate solutions to them – depends on political objectives other than that of Pareto-optimality: for instance, the just distribution of income and opportunities, the boundaries between the economic and the political sphere, etc. If environmental economics really aims at being a policy science and is prepared to respect the politically defined objectives, it is bound to investigate the extent to which the institutional organisation of existing economies is able to meet those objectives. Environmental economists who want to narrow the gap between economic theory and public policy are thus obliged to extend their analysis to the political domain with its actual political objectives on the one hand, and to existing economic institutions responsible for the (non-)realisation of these objectives on the other.

Thus, both from an ecological and a political perspective, it seems wise to extend the subject matter of environmental economics in order to be able to solve environmental problems not only more adequately, but also more in conformity with actual political goals. This extension, however, requires a different interpretation of economic objectivity, since the conventional interpretation is intrinsically connected with the content, or the subject matter, of conventional economics.

3. THE MEANING OF CONVENTIONAL OBJECTIVITY

In Pearce's view, environmental economics is a version of neo-classical welfare economics in the public interest of 'sustainable development'. The task of environmental economists consists of informing the government on 1) the 'value' of externalities and 2) the economic instruments available to internalise these externalities. They therefore need a theory of economic valuation (dealing with the development and application of methods for estimating individuals' values for environmental changes, based on revealed and stated preferences) and a theory of environmental regulation (where efficiency is the guiding principle for selecting environmental policy instruments).

Conventional environmental economics looks for an objective assessment of the value of environmental goods and services. 'The purpose of economic valuation is to reveal the *true* costs of using up scarce environmental resources' (Pearce 1993, 5; my italics). In order to discover this 'true' value, Pearce first defines what kinds of values have to be taken into account. He argues for a consideration of 'the total economic value' of environmental goods and services (e.g. Pearce and Turner 1990, chapter 9; Pearce 1993, 15–22).[1] After establishing the component parts of total economic value, Pearce clarifies the nature of the values he has in mind. Defining economic values consists of discovering individuals' *preferences*. 'What economic valuation does is to measure *human preferences* for or against changes in the state of environments. It does not "value the environment" '(Turner et al. 1994, 38). What counts is that, in Pearce's opinion, interpreting values as preferences – which is a non-neutral translation – is one necessary condition for guaranteeing an objective assessment of environmental values. Defining the value of environmental assets is, in the last instance, a matter of empirical investigations: economic valuation techniques attempt to ascertain either revealed or stated preferences (Turner et al. 1994, 116). Empirical testability of the data used thus is one aspect of economic objectivity.

The use of money as a measuring rod for environmental values is a second necessary condition for economic objectivity (Pearce 1993, 13). Expressing values in monetary terms allows for a comparison of different values. This

comparison is necessary for two reasons. First, it is necessary in order to compare the relative weight of the different component parts of total economic value. Second, it is necessary because environmental economics searches for the social value of environmental goods and services, not for individual values (Turner et al. 1994, 94). This social value can only be derived from individual values on condition that individual values can be compared, since social value is the sum or the aggregation of individual values. Money as a common measuring rod is what makes the aggregation of environmental values objective. The mathematical exactness related to calculating with amounts of money is thus a second aspect of economic objectivity.

The third and fourth aspects of Pearce's interpretation of economic objectivity can be derived from his belief in the effectiveness of economic instruments for (allocatively) efficient realisation of (economically or politically decided on) environmental protection levels. In other words, the third and fourth aspects of economic objectivity are related to the predictive success of economic theory. This predictive success depends on the one hand on the logical consistency of the set of laws developed for the description of this kind of economic action. It depends, on the other hand, on the empirical validity of the boundary conditions (for instance, the nature of *homo oeconomicus*) which define the kind of economic actions treated by the theory of marginal utility. With the help of Weber, I will explain both aspects more thoroughly.

In Weber's vision, (pure or exact) economics, i.e. the theory of marginal utility, exclusively consists of laws expressed in mathematical formulas and ordered in a logically consistent axiomatic system (*GAW*, 392; *MSS*, 43). In this sense, economic theory is formally analogous to exact natural science. For that reason, the theory of marginal utility is the main supplier of analytical instruments for the understanding of individual economic events. Contrary to the laws and concepts of the natural sciences, however, economic concepts and laws (like all concepts and laws in the cultural sciences), do not have 'metaphysical validity', i.e., they are not simply 'true' – they do not necessarily correspond to states of affairs in empirical reality. They are ideal-typical. In a certain sense they are 'pure fictions', heuristic instruments that enable us to describe and explain empirical reality.

> Pure economic theory, in its analysis of past and present society, utilizes ideal-type concepts exclusively, Economic theory makes certain assumptions which scarcely ever correspond completely with reality but which approximate it in various degrees and asks: how would men act under these assumed conditions, if their actions were entirely rational? (*MSS*, 43–4).

The subject matter of pure economics is *rational* economic behaviour, i.e., human action which is 'caused' by the only economic motive *and* which succeeds in satisfying this motive. The theory of marginal utility presupposes,

among other things, that people are able to act more or less instrumentally, i.e., that they can choose the correct means for a given end by making use of their experience and their capacity to calculate in advance (*GAW*, 390). Economic theory tries to catch this kind of successful (i.e., rational) behaviour in a logically consistent axiomatic system. Pure economics thus derives its theoretical validity from the logical consistency of its abstract axiomatic system. This logical consistency is what I call the third aspect of economic objectivity.

This theoretical validity is, however, completely independent of the practical relevance of pure economics. Whether the theory of marginal utility is practically relevant or not depends on two elements. First, it depends on the presence of other possible causes which are deemed relevant for individual economic events:

> the degree of significance which we are to attribute to [purely – MD] economic factors is decided by the class of causes to which we are to impute those specific elements of the phenomenon in question to which we attach significance in given cases and in which we are interested. (*MSS*, 71)

Second, the extent to which people behave 'objectively rationally' is decisive for the practical relevance of pure theory. According to Weber, human conduct is often irrational: 'errors in thinking or calculation can constitute causal factors of the course of action' (*MSS* 42).

Despite this analytical gap between the theoretical validity and practical relevance of pure economics, Weber does not really doubt its political role. In his view, the contribution of the social sciences consists in providing public policy with adequate means for given ends and in informing it about the consequences of using certain means. Giving information on adequate means and inevitable consequences is a purely technical problem. It is simply a question of inverting cause/effect relations into means/end relations.

> It would be superfluous to repeat that it is obviously possible and scientifically useful and necessary to establish propositions of the following type: in order to attain the end x (in economic policy), y is the only means, or under conditions b_1, b_2, and b_3, y_1, y_2 and y_3 are the only or the most effective means. […] Hence it is simply a question of inverting causal propositions; […]. It is indeed on this account that science is not compelled to formulate these technical teleological propositions in any form other than that of simple causal propositions, e.g., x is produced by y, or x, under conditions b_1, b_2, and b_3 is produced by y_1, y_2 and y_3. For these say exactly the same thing, and the 'man of action' can derive his 'prescriptions' from them quite easily. (*MSS* 44–5)

Weber's rather unreserved belief in the political relevance of economic theory betrays his conviction, despite his analytical reservations, that the boundary conditions of pure economics *are* empirically valid. This conviction is manifest in the following quotation:

> The historical peculiarity of the capitalistic epoch, and consequently also the meaning of the theory of marginal utility for the understanding of this epoch, rests on the fact that […] under the present conditions of life the approximation of reality to the theoretical propositions has been continuously growing, drawing the fate of ever larger strata of humankind into it, and, as far as one can see, it will go on. (*GAW*, 395)

The empirical validity of the boundary conditions or assumptions of economic theory constitute the second condition for predictive success. I call this empirical validity the fourth aspect of economic objectivity.

4. OBJECTIVITY AS NON-NEUTRAL COMMON CONSENT

As a preliminary result, we could conclude that conventional economic objectivity has four components: 1) the empirical testability of the data, 2) the logical consistency of the axiomatic system of economics, 3) the empirical relevance of its assumptions, and 4) the mathematical exactness of its calculations. These four aspects together are meant to exclude divergences of opinion between the different members of the community of economic scientists. Indeed, according to Weber, the purpose of all social sciences is to achieve *supra-cultural* validity (*MSS*, 58–9). In other words, objectivity ultimately comes down to common consent. Common consent can, according to the conventional interpretation of economic objectivity, be reached by excluding as much as possible all elements that can prompt differences in interpretation of reality due to the contingencies of the subjective perspectives of individual economic scientists. Logical consistency, mathematical rigour and empirical testability (of the data and of the assumptions) are considered to be rather evident means to exclude individual contingencies.

The conventional interpretation of economic objectivity, however, overlooks the fact that these aspects of common consent are based upon an underlying value-laden agreement (or common consent) concerning the subject matter and analytical instruments of economic theory. With the help of Weber, I shall offer a fuller explanation.

To begin with, the object of economics consists of cultural, or meaningful, phenomena. Cultural phenomena are phenomena related to value ideas (*MSS*, 76). Because cultural reality is endlessly complex and because the human mind is finite, economists cannot tackle the infinite economic reality without carving a finite portion out of it. The criterion used in economics to select this segment includes certain value ideas. These value ideas define the selection of the empirical data deemed relevant. They thus define the subject matter of economics. However, value ideas not only define the subject matter, but also the concepts and laws and, consequently, the boundary conditions that become the instru-

ments of scientific research and of economic theory. Precisely to express the value-relatedness of these theoretical instruments, Weber introduced the term 'ideal-type'.

> An ideal type is formed by the one-sided *accentuation* of one or more points of view and by the synthesis of a great many diffuse, discrete, more or less present and occasionally absent *concrete individual* phenomena, which are arranged according to those one-sidedly emphasized viewpoints into a unified *analytical construct* (*Gedankenbild*). (*MSS*, 90)

Which value ideas must underlie the definition of the subject matter and the analytical instruments of economic theory is, according to Weber, a question that cannot be answered scientifically. The values that consciously or unconsciously direct the scientific endeavour are the result of ultimate decisions through which the scientist's soul 'chooses its own fate' (*MSS*, 18). Since the concepts, laws, boundary conditions and empirical data of an economic theory depend on the perspective of its architects, Weber admits that a multiplicity of economic theories is possible (*MSS*, 91). However, an unimpeded proliferation of theories related to different value ideas is only a theoretical possibility which never takes place in actual practice. Scientific communities are much more uniform than the abstract possibility of an infinite multiplicity may suggest. Economics is 'socially constructed': only when subjective presuppositions acquire – consciously or unconsciously – common acceptance within a specific community of economic scientists (i.e., when they are *made* commonly accepted) do they become a base for valid economic knowledge. Common consent, in its turn, does not exclude the existence of more than one scientific view on reality. It only explains the grouping of researchers who have the same motives and values and hence the same scientific interests (*MSS*, 61–3). It leaves undiminished room for an incessant shift of viewpoints, a continuous redefinition of concepts and, above all, for conflicts about methods and fundamental concepts – particularly, for '*two* sciences of economics' (*MSS*, 63).

Weber himself offers two reasons why the underlying agreement concerning the subject matter and analytical instruments easily gets overlooked. First, it results from the training of students in economic theory:

> The justification of the *one-sided* analysis of cultural reality from specific 'points of view'- in our case with respect to its economic conditioning – emerges purely as a technical expedient from the fact that training in the observation of the effects of qualitatively similar categories of causes and the repeated utilization of the same scheme of concepts and hypotheses (*begrifflich-methodischen Apparates*) offers all the advantages of the division of labor. (*MSS*, 71)

This division of labour promotes the scientist's lack of awareness of his own evaluative motives. Moreover, raising these unconscious motives to the level of

consciousness is, according to Weber, rather difficult. The motives of scientific labour 'often cannot be clarified and analyzed in a tangible and intelligible form in any other way than through the *confrontation* of the standards of value underlying the ideas criticized with others' (*MSS*, 59–60; my italics). Raising all unconscious motives to a conscious level is – and this is my opinion – impossible: the goal of complete evaluative transparency does not belong to this world.

To recapitulate, the so-called objectivity of conventional economics depends on the factual common consent within the community of (conventional) economists. This common consent consists partly in the logical consistency, mathematical rigour and empirical testability of pure economics and partly in agreement concerning the value ideas that constitute its subject matter and analytical instruments. I am convinced that the two elements constituting common consent can at most be distinguished, but cannot be separated. Empirical data deemed relevant (e.g., revealed or stated preferences expressed in monetary terms) at the same time define the relative importance of logic and mathematics and *vice versa*. The fact that the second element of objectivity as common consent – namely, the agreement concerning the subject matter and analytical instruments of economic theory – is often overlooked easily gives rise to an interpretation of economic objectivity as ethical neutrality (see, for instance, Bromley 1991, 207).

5. NON-NEUTRALITY AS A PROBLEM FOR ENVIRONMENTAL ECONOMICS AS A POLICY SCIENCE

The value-related perspective of economic theory – as reflected in the choice of its subject matter and of its analytical instruments – implies that economic objectivity *is not* and *cannot be* neutral. More specifically, the non-neutral evaluative perspective of conventional environmental economics is allocative efficiency. This implies, contrary to what Weber suggests, that the political relevance of economic theory is not simply a technical matter. Economic theory does not simply offer technical (i.e., neutral) recommendations concerning how to realise particular political objectives. It also prescribes the political objective that political officials and the citizenry *should* have, namely the political objective that conforms to the evaluative perspective of the theory. Conventional environmental economics, more concretely, prescribes allocative efficiency as the guiding principle in political decision-making.

Bromley and Pearce react differently to this implicit political objective of conventional environmental economics. Pearce acknowledges that allocative efficiency is a non-neutral principle underlying conventional economic theory. However, he uses emotivistic arguments to defend his choice for neo-classical welfare economics as a suitable approach to environmental problems. He writes:

> Since any economics needs value judgements, and in the absence of agreed meta-ethical criteria for choosing between value judgements, it cannot be argued that neoclassical economics and its Paretian value judgements are 'worse' or 'better' than any other economic doctrine. (Pearce and Turner 1990, 4)

Indeed, allocative efficiency functions in Pearce's writings as the evaluative criterion by which he judges the outcomes of actual politics. Although Pearce concedes at times that citizens can have other political objectives than allocative efficiency, that objective emerges in his writings as the single inclusive end that is intended to accommodate all other ends. If political officials and citizens have other political objectives, conventional environmental economists have nothing to offer them. Or, worse, they tend to reproach them with a lack of efficiency, and to accuse public authorities of 'government failures' (see, for instance, Pearce and Warford 1993, 204; Pearce et al. 1993, 187–202). Pearce thus chooses, in the words of Bromley, for the first alternative open to economists in the matter of public policy analysis:

> The first is to hunker down, to press ahead with the current intellectual agenda, and to become ever more shrill about the inscrutability of the political process. On this tack we would continue to explore alternative surplus measures, and to insist that the potential Pareto test represents an objective truth rule regarding what the public sector should be doing. (Bromley 1991, 220–221)[2]

Bromley himself prefers the other alternative. 'The other tack would be to admit that the collective interest transcends the reductionist Pareto rule. Once this threshold has been crossed, we would be free to harness the impressive intellectual heritage of economic analysis to the task of designing an evaluative approach that reflects the concerns of public decision makers as opposed to one that reflects what we *think ought to concern them*. This task of building an alternative and intellectually legitimate paradigm does not belong only to the critics of received wisdom. It is a shared burden made more compelling by the simple rules of intellectual honesty' (Bromley 1991, 220-221).

From Bromley's writings one can easily derive some elements of the 'alternative and intellectually legitimate paradigm' he has in mind. The subject matter comprises, on the one hand, the goals and objectives of individuals and groups 'even when those goals and objectives are expressed in terms other than those of the Pareto test or of improving the net social dividend as measured in monetary terms' (Bromley 1991, 226). On the other hand it comprises the ecological performance of particular property regimes in particular situations.[3] Bromley stresses that this alternative subject matter of environmental economics undiminished asks for objectivity. Objectivity is one characteristic of an 'intellectually legitimate paradigm'. However, this objectivity will no longer be of the same nature as the objectivity associated with methodological individualism. The alternative concentrates on political objectives rather than on the prefer-

ences of individuals as revealed by markets or as stated in surveys. It concentrates on institutions as the results (i.e., unpredictable events) of political processes, and as the conditions that influence individuals' preferences (and actions). This alternative objectivity will thus differ from the logical rigour associated with 'rational economic behaviour' (whether bounded or not) in a context of given institutions and of given wants and needs. It will also differ from the mathematical rigour of monetary calculations.

Bromley is, to some degree, aware that objectivity does not simply imply neutrality. He distinguishes between the objectivity of a science and the objectivity of a scientist. In his view, the objectivity of a science is related to the degree of correspondence between the real world and our mental abstraction of it, i.e., our model or theory. The objectivity of a scientist is related to what Bromley calls his/her 'neutrality', i.e., his/her capacity to omit his/her subjective values in order to reach the same scientific results as his/her scientific colleagues. 'The objectivity of the scientist lies in the extent to which independent investigators can reach similar conclusions about the correspondence of theory and reality' (Bromley 1991, 221). I feel obliged to comment on Bromley's distinction between and definitions of the objectivity of a science and of a scientist in order to sharpen them.

To begin with, testing the so-called 'correspondence' of a theory with reality comes down to reaching common consent concerning the adequacy of a model. Consequently, the objectivity of a science cannot be separated from the objectivity of a scientist. Both kinds of objectivity are always simultaneously checked: the objectivity of a theory is a check for the objectivity of the theorist and *vice versa*.

Moreover, since scientists always conceive reality from a specific evaluative perspective, theories never simply 'correspond' to reality. Indeed, contrary to what Weber seems to suggest in some passages, objectivity as common consent is not the same as empirical truth. This kind of objectivity only guarantees that whoever investigates economic reality reaches the same analytical ordering of it, on condition that he or she accepts – at least during the investigation – the underlying value ideas (*MSS*, 58).

> … the successful *logical* analysis of the content of an ideal and its ultimate axioms and the discovery of the consequences which arise from pursuing it, logically and practically, must also be valid for the Chinese. At the same time, our Chinese can lack a 'sense' for our ethical imperative and he can and certainly often will deny the ideal itself and the concrete value-judgments derived from it. Neither of these two latter attitudes can affect the scientific value of the analysis in any way. (*MSS*, 58–9)

This scientific value thus does not imply that economic theory is an unequivocal reflection of reality (MSS 90-93). In this sense, the objectivity of economic theory does not guarantee 'truth' (or correspondence between the model and

reality), with its connotations of uniqueness and universal validity. Different scientists do not only choose different segments of reality to study, as Bromley acknowledges (Bromley 1991, 221). Their choices at the same time originate from specific perspectives, from specific underlying value ideas. Consequently, developments within a specific discipline do not automatically result in what Bromley calls a growth of science (Bromley 1991, 221). They can also result in different – objective, but differently non-neutral – disciplinary theories.

Because of the unavoidably value-laden perspective of any scientific theory, it is not very accurate to speak of 'neutral' scientists. This neutrality – which must guarantee the objectivity as common consent among members of a scientific community – is illusory. It results from oblivion or lack of awareness, based on an unnoticed agreement, concerning the wide variety of value ideas inherent with a particular scientific paradigm. A recognition of this inevitably evaluative theoretical perspective prevents us from speaking of neutral scientists any longer. As I mentioned earlier, Bromley must be aware of this tacit agreement since he refers to the ideology of a paradigm.

> Normal science is an ideology in that the recognized body of practitioners hold similar *beliefs* about phenomena and processes that define the accepted domain of enquiry. Indeed the very act of acquiring training in a particular scientific discipline is to understand and accept its ideology in the latter sense. To be 'trained' is to be socialized into a paradigm. To talk of the ideology of a scientific discipline is not to imply fervor or propaganda. It is, instead, to recognize that the essence of a discipline is shared beliefs about the meaning of events, about how to process information about those events, and about how to add to the body of systematic concepts that ultimately differentiate one discipline from another. (Bromley 1991, 206)

Recognising the non-neutrality of objective environmental economics (and of objective environmental economists) is not without consequences for our understanding of its political relevance. To start with, the political relevance of a particular economic theory will depend on the compatibility between the value ideas defining its perspective and the value ideas defining actual political objectives. Whether Pearce's or Bromley's definition of environmental economics is politically more relevant cannot be decided with the help of scientific criteria. It depends on the actual political situation.

Moreover, since the value ideas underlying economic theories as well as political objectives can never be completely transparent, economic recommendations concerning environmental policy will never be simply a technical matter. For that reason, I suggest that environmental economics should try to provide public authorities not so much with 'instruments' in order to realise their political goals effectively, as with 'insights' into actual reasons for the non-realisation of their political objectives. The development of policy 'instruments' out of scientific 'insights' is a political, not a scientific matter: it rests on a lot of – often

implicit – normative, and hence typically political, choices concerning a desirable future, not on a scientific extrapolation of the *status quo*.

Finally, because of this same lack of transparency concerning the value ideas that underpin economic theory as well as environmental policy, I do not fully agree with Bromley that 'in policy science the economist must first ask (or determine) the goals and objectives of those affected by a policy, an activity that requires the greatest possible level of objectivity, and then objectively draw on theory to propose which avenues will maximize the chances of attaining those objectives' (Bromley 1991, 223). Politics and science mutually influence each other. The political susceptibility of environmental economists can inspire their scientific work, just as the scientific susceptibility of political officials and citizens can inspire their political environmental goals. This conclusion implies a need to encourage a multiplicity of theoretical paradigms rather than the unidirectional growth of one dominant paradigmatic theory.

6. CONCLUSION

An analysis of Pearce's writings reveals that the objectivity of conventional environmental economics consists in 1) the empirical testability of data, 2) the empirical relevance of its boundary conditions or theoretical presuppositions, 3) the logical consistency of its axiomatic system, and 4) the mathematical exactness of its calculations. I argue that these elements are meant to contribute to common consent. I therefore re-interpret scientific objectivity as common consent within a particular community of scientists.

A closer analysis of economics as a social science – inspired by the writings of Max Weber – shows that the common consent just mentioned is based on an underlying common consent concerning the value ideas defining the definition of the subject matter and analytical instruments of a theory. For that reason, scientific objectivity does not and cannot imply neutrality. Non-neutral objectivity thus leaves room for different paradigms of environmental economics.

In the latter part I suggested some consequences of the – never completely transparent – non-neutrality of economic objectivity for the practice of environmental economics as a policy science. These suggestions are rather preliminary. Further research is needed to offer a fuller analysis of their meaning.

NOTES

[1] Total economic value consists of use and non-use values. Use values are direct values (e.g. the output of forest products, energetic and material resources), indirect values (e.g. ecological functions such as watershed protection, storm buffering, waste assimilation) and option values (values that relate to the desire to keep open the possibility for future use). Existence values are non-use values. They refer to valuations of environmental

assets purely for the sake of keeping them in existence, unrelated to either current or optional use.

[2] Bromley defines an 'objective truth rule' as an 'accepted behavioral norm that allows the economist to offer up an efficient outcome both as evidence of a "good" thing and [...] as proof of the *scientific objectivity* of that particular finding of goodness' (Bromley 1991, 206). Bromley explicitly draws attention to the fact that this interpretation of allocative efficiency as evidence of neutral, scientific objectivity is part of the ideology of the conventional economic paradigm.

[3] Although Bromley pleads for an understanding of the ecological performance (and of the incidence of costs and benefits) due to the prevailing institutional arrangements (Bromley 1991, 226-227), his analysis mainly concentrates on property regimes, which are a subset of these institutional arrangements.

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