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Is there Progress in Normative Economics?

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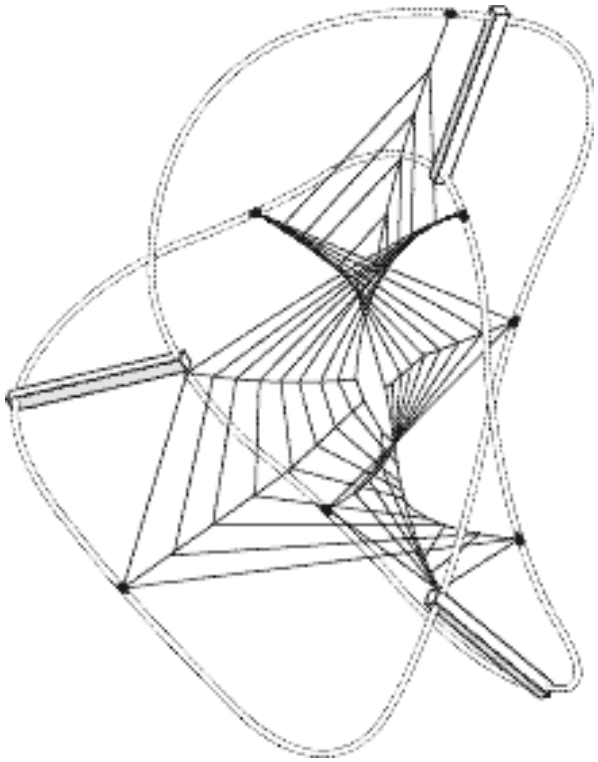

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ABSTRACT

The paper discusses the sense in which the changes undergone by normative economics in the 20th century can be said to be progressive. A simple criterion is proposed to decide whether a sequence of normative theories is progressive. This criterion is put to use on a classic case, i.e., the transition from the "new welfare economics" to social choice theory. The paper concludes with a cautious "yes" answer to the question of the title. It includes some comments on the more recent developments in normative economics.

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1. Difficulties surrounding the question, but why it does arise

In this paper I take up the challenge of discussing progress in normative economics. The difficulties surrounding the enterprise are obvious. First of all, it is notoriously hard to say what exactly normative economics is about - welfare or choice, value judgments or the study of values judgements, economic policy or armchair evaluation. Economic methodologists or theorists have provided grand statements on how normative economics should be separated from positive economics and applied economics; see Keynes (1890), Robbins (1932), Samuelson (1947), Little (1950), Archibald (1959), to name only a few. However, these accounts are hardly compatible with each other, and it is not always clear how they relate to the work actually done in economics. This paper will adopt the following noncommital view: The task of normative economics is to investigate methods and criteria for evaluating the relative desirability of economic states of affairs. This is a noncommital statement because it does not say whether normative economics itself endorses the evaluations (and thus *makes* value judgments) or just explores the way of making them (and thus only *relates to* value judgments). It does not decide either whether a more desirable state is one involving more welfare, or more choice, or more of anything else. Despite its generality the definition is not vacuous. It makes it clear that normative economics has a teleological rather than a deontological structure, to use the familiar ethical distinction. That is, normative economics draws conclusions about the rightness of actions (here, policy arrangements) from a prior investigation of the « goodness » of economic states of affairs. The definition also encapsulates the claim that normative economics is primarily concerned with *evaluations*, and only derivately with *recommendations*. For instance, there is room for assessing the functioning of markets, whether or not the resulting evaluations can be translated into relevant policies. This is a claim that I am going to take for granted here, even if I realize that some economists might disagree with it.

A second difficulty is that philosophers do not provide obvious guidance for the question I am tackling. Philosophers have nearly exclusively discussed progress in relation to science, while rarely contemplating the possibility that there is such a thing as *normative* science.[1] A further difficulty is that most of

[1]There is nonetheless a continental tradition of considering ethics as a normative science; see Kalinowki (1969) who traces it back to the Leipzig philosopher Wundt at the end of the 19th century. However, this tradition has had little influence even in France and Germany.

the available work on scientific progress deals with the empirical sciences; very little has been written on progress in logic and mathematics. Admittedly, even stated for empirical sciences like physics or biology, a suitable notion of *conceptual* progress could prove valuable for my purpose. Unfortunately, philosophy of science does not have so much to say about the more theoretical side of progress in the empirical sciences.[2]

Despite these bleak prospects, the question of this paper is a natural one to ask for anybody conversant with the field. Normative economics exhibits a relatively simple pattern of development, and to the specialist, this pattern is both *intelligible* and *oriented*. Many economists actually believe that it is a *progressive* pattern - although they cannot explain in detail what they mean. I am very much interested in making sense of this intriguing view and assessing it. I offer this as an excuse for embarking on an adventurous paper.

2. The historical pattern of normative economics

The pattern is well-known. The "economics of welfare", as Pigou (1920) termed it, reformulated and extended some of the analyses of welfare and the efficiency of markets that could be found in Marshall and other early Neo-Classicals. Pigou's work is evidently more focused than his predecessors' piecemeal contributions. It is also more normative in the sense of my definition. Typically, it is clearer in distinguishing between the abstract conditions for increased welfare and the way they present themselves in the market or the way they can be implemented by the State. Pigou also made a step towards stating welfare conditions in terms of optimality conditions, although it is far from clear what his maximand was.[3] Whatever the exact meaning of his optimality conditions, he formulated them in such a way that they also bore on the distribution of income. Hence the easy and common reconstruction of Pigou's *Economics of Welfare* as being implicitly utilitarian - a reconstruction which I believe needs scrutinizing again. This old-style welfare economics is the first form of normative economics.[4]

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[2]This has been emphasized by Laudan (1977, ch.2). His attempt to go beyond this negative diagnosis is meritorious but still sketchy.

[3]As Arrow (1983, p.18) wrote in a brief but acute commentary on Pigou.

[4]I will put Pigou aside in the rest of this paper. There is a valuable chapter on Pigou in Myint's (1942) history of early welfare theories. But again, *The Economics of Welfare* calls for a detailed reappraisal.

The so-called *new welfare economics*, which crystallized in the 1930s, corresponds to the second form. It was much clearer than the old welfare economics about its premisses - prominent among which was what we now call the Pareto Principle -, and it eventually reached a conceptually clear separation between the optimality conditions themselves and their application to markets. The most famous applications obtained in these years were the so-called fundamental theorems of welfare economics – I am using again the modern terminology for simplicity. The first "fundamental" theorem states that under relevant conditions, a competitive equilibrium satisfies the conditions for a Pareto optimum. The second "fundamental" theorem says that under other relevant conditions, any Pareto optimum can be obtained as a competitive equilibrium after the agents' initial endowments have been modified by suitable lump-sum transfers.[5] Using different conceptual and technical means, the new welfare economics pursued a slimmer version of Pigou's programme. Officially, it put aside the evaluation of income distribution (left to the politician or the « economist qua person »). The so-called Compensation Principle, on which I will expand later, was an attempt to go beyond the Pareto Principle while stopping short of utilitarianism - and, allegedly, of any interpersonal comparisons of utility whatever.

The third stage corresponds roughly to two different forms of normative economics, i.e., social choice theory on the one hand, and public economics on the other. Despite the obscurities in Pigou, the transition from the old to the new welfare economics seems to be relatively smooth and not too difficult to follow, while the transition to the third stage is neither. It is often said that Arrow's *Social Choice and Individual Values* in 1951 gave a fatal blow to the new welfare economics. However, this claim has been disputed violently by the welfare economists. Whatever its intended meaning, it cannot be that social choice theory superseded welfare economics in its traditional role of assessing the working of markets and proposing improvements in terms of corrective taxes and the like. The agenda of social choice theory is to investigate the various abstract methods of evaluating social states. Applications may or may not be market-related and anyhow enter social choice theory mostly by way of examples. From the seventies onwards, it has been incumbent to the newly created discipline of public economics to discuss market optimality and policy corrections. According to an insider's suggestion,[6] public economics absorbed

[5]Beginners sometimes believe that the two theorems taken together form an equivalence statement. This is not the case.

[6]Hammond in his valuable survey of progress in public economics (1990).

much of the content of the "new welfare economics" that had survived social-choice-theoretic criticism. Thus, there are two, quite distinct forms of normative economics being currently practiced in parallel. There may be even more than two if one takes into account inequality theory and poverty theory, which have developped in a quasi-autonomous way from the seventies and eighties. Just by itself, the division process undergone by normative economics is enough make the transition from the second to the third stage a complicated affair.

There is some evidence that normative economics might be undergoing a fourth change. The bulk of social choice theory up to the mid-eighties, and public economics throughout as far as I can judge, are *welfarist*. That is to say, they take the information provided by the individuals' utility functions to be necessary and sufficient data for the social choice or the public decision. This was the element of continuity between the third stage and the first two, as it were. From the broader point of view of social ethics, welfarism is a restrictive, and indeed conceptually problematic, principle to adopt. Internal criticism, especially Sen's later work, as well as the recent dialogue between philosophers and economists, have helped to bring this point home. Some economists have actually started to reorient social choice theory in a non-welfarist direction. Sometimes they dispense altogether with utility functions, as when analyzing rights. More commonly, they supplement utility information with other sources, as when discussing talents and handicaps, opportunities and "capabilities". This theorizing is covered by labels such as "economic theories of justice" or of "equity", which suggest a philosophical potential that welfare economics never claimed for itself. But there are also numerous hints of economic applications, and even sometimes of how the new construals could be introduced into public economics. So arguably, normative economics is undergoing another metamorphosis. I hasten to add that not everybody in the field - even among those who actively contribute to reshape it - would agree with this suggested diagnosis. Some of the theories also discussed under the "economic justice" or "equity" labels happen to be welfarist in the sense of this paragraph.[7] And it is a fact that public economists have hardly begun to catch up with the new developments. This said, nobody would deny that normative economics is on the move again, at least in its more theoretical parts, and that welfarism is one of the major issues currently under discussion.

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[7] Two prominent examples are the recent constructions based on the "non-envy" and "egalitarian-equivalent" concepts; see Fleurbaey and Maniquet (1999) for a survey. Fleurbaey (2000) has recently argued that the welfarism versus non-welfarism divide is perhaps not as crucial as the following question: Does the given theory implicitly obey Arrow's independence condition, or does it not?

We are now at a convenient historical distance to decide whether the third stage can be considered a progressive one. For this reason I will focus on this particular transition despite a corresponding drawback - i.e., I will have to recast arguments that are well-known to at least some of the readers. But I will give my own twist to the familiar story. Partly out of sheer incompetence, I concentrate my efforts on social choice theory, saying next to nothing about public economics. I do not think we are yet in a position to say anything definite about the last transition, but it turns out that my argument leads me to discuss it, however tentatively. I am going to argue that the transition to social choice theory was indeed progressive, but that the case against welfare economics was not properly sorted out until the fourth stage.

3. A provisional definition of progress

I start by contrasting intertheoretic with intratheoretic progress. It is perhaps not too difficult to recognize advances made within the confines of a given theory, especialy when it is as clearly structured as are the new welfare economics and social choice theory. There is a story of successive clarifications of the two fundamental welfare theorems, and a story of successive refinements of Arrow's impossibility theorem. Both would exemplify a form of progress in normative economics, but this is not the form I am interested in diagnosing. Intertheoretic progress is what this paper is about.

When it comes to intertheoretic progress, controversy bursts out, and we can hardly do without an explicit definition. I will make a brave attempt at providing one. Let us then say that a shift from a theory T to a theory T' is progressive if: (1) T' provides a solution to at least one unresolved problem of T; (2) T' provides a solution to the main problems that T had already addressed and resolved in its own way; (3) T' raises new problems and manages to solve at least some of them.

This definition embodies the three ideas of (1) constructive criticism, (2) theoretical continuity, and (3) independence that are arguably the component parts of the common-sense notion of progress. Notice that if we take T and T' to refer to distinct variants of the same theory, we get a working definition of intratheoretic progress, supposing one is needed.[8] Importantly, the definition

[8]The three clauses together, and not just two of them, appear to be required even in the case of intratheoretic progress. Dan Hausman helped me to see this point.

does not make particular reference to normative theories. The concept of problem-solving is broad - and vague - enough to apply to them as well as to theories in the empirical sciences and in mathematics. When problems are construed as either predictions to be confirmed or facts to be explained, we get a relevant case of the definition, and it then becomes close to that of a progressive shift in Lakatos (1970).

Actually, some of the experience gained in discussing Lakatos's methodology and related conceptions can be put to use here. As to (1), the analogy with the methodology of research programmes suggests that there are two possibilities to consider. Either the "unresolved problem" is already recognized by T and is very much like a Lakatosian *anomaly* accompanying T. Or it is not only solved but also pointed out by T', in which case it is like a *novel fact*. We might expect both situations to occur with normative theories. It is arguable that standard ethical rules, such as utilitarianism, are accompanied with anomalies.[9] In normative economics, the many difficulties surrounding the Compensation Principle were treated, at least initially, like anomalies. I will expand at length on an example - Arrow's theorem - which illustrates the opposite analogy of a novel fact.

Something we learned from the discussions on the methodology of research programmes is that it is most delicate to construe theoretical continuity appropriately. Instead of (2) I might have required that T' solve *all* the significant problems already solved by T. This would be asking too much, exactly as Lakatos's (and Popper's[10]) famous requirement of non-decreasing content has proved to be exacting. To say that just *one* of the earlier problems needs to be solved would be too lax. Accordingly, I remain vague in my clause (2) even if this is not very satisfactory. Obviously, clause (3) plays the same role as the requirement of added content in Popper and Lakatos; it serves to exclude *ad hoc* modifications of T. Lakatos insisted against Popper that at least one of the independent predictions should be borne out by the facts. My suggestion for (3) parallels his own condition, and is presumably open to the charge of disguised inductivism that was levelled against it by the Popperians.[11]

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[9]Think for instance of the discussion (and eventual dismissal) of fanaticism in Hare's (1976) utilitarian theory. The notion of anomaly is by no means limited to the empirical sciences. Mathematical theories can be accompanied with anomalies, as Lakatos's (1963-64) classic polyhedron example shows.

[10]See, e.g., Popper (1963).

[11]The issue of inductivism in the non-empirical sciences is touched on in Howson (1979). His paper also makes suggestions on how to apply Lakatos's methodology of scientific research

Here is where the analogy breaks down. The classic requirements of increasing testable content in Lakatos and Popper imply that there are *logical* relations between successive theories. On the simplest construal, T and T' will share a subset of their logical consequences. If allowance is made for the obvious fact that theories need auxiliary statements in order to deliver predictions, this straightforward conclusion need not hold anymore. But it is still the case that T and T' will be logically related, although in terms of other statements and in a possibly non-transparent way. Nothing of the sort is implied by the above definition. T and T' might respond to the same problems using entirely different means. For instance, it can happen that the problems that T was resolving actively are shown not to *arise* in T'. I would regard this as an instantiation of clause (2). Generally, when the notion of a successful prediction gives way to that of successful problem-solving, much - perhaps too much - flexibility is introduced. The theories in a sequence declared to be progressive according to (1), (2) and (3) may well be loosely related to each other. Such a state of affairs would conflict with the intuition that progress is revolution-with-continuity, as it were. Having pointed out an *a priori* difficulty for my tentative definition, I can only hope that the narrative will suggest improvements.

4. The social-choice-theoretic critique of welfare economics: historical landmarks

As I said, the new welfare economics clearly isolated and laid considerable emphasis on the problem of determining the conditions for maximum economic welfare (or the conditions for the General Optimum as they were also called). The problem was resolved while assuming nothing about the measurability and interpersonal comparability of utility - that is, in contemporary language, by invoking only the Pareto Principle. For the purpose of this discussion I will restrict attention to the late restatements of this solution in Bergson (1938) and Lange (1942). These two papers were authoritative at the time. They exemplify the new welfare economics at its best, and are therefore suitable for a discussion of progress.

Bergson takes the step of discussing the economic welfare conditions in terms of a given function E - "the Economic Welfare Function" (1938, p. 312) - that depends on all the individuals' consumptions of commodities and supplies of

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programmes to non-empirical sciences like mathematics, and is thus an interesting exception to the state of the art described in the introduction.

factors. Bergson just makes broad qualitative restrictions, i.e., that E is increasing in consumption and decreasing in factor (i.e., labour) supplied, and, at some point, that it satisfies the Pareto Principle.[12] Bergson's contribution is to show that this thin set of assumptions is sufficient to obtain the already known conditions for maximum economic welfare, i.e., that the marginal rates of substitution between commodities are equal from one individual to another, and similarly for the other relevant marginal substitution and transformation rates. As Bergson also explained, more special conditions that had also appeared in the past could be traced back to supplementary assumptions made on the shape of E - for instance, some of the conditions considered in the Cambridge tradition depended on assuming an additive form for E. Each time the relevant marginal conditions could be obtained as the first-order conditions of a constrained maximization programme, with the technical possibilities taken as the constraint.[13] Samuelson's *Foundations* (1947) followed Bergson's method of discussing the General Optimum in terms of a welfare function; hence the expression used afterwards, "the Bergson-Samuelson welfare function".[14] For the purpose of the discussion to come, I mention that neither author was clear about the extent to which a "Bergson-Samuelson welfare function" E requires interpersonal comparisons of utility. They knew that the Cambridge additive function does; but they had not sorted out whether or E does *in general*.

The second part of Lange's paper contains a related and even clearer discussion of the General Optimum than Bergson's, but the first part stands in sharp contrast with the latter's method of analysis. There, Lange introduced the (by now well-known) method of computing Pareto optima by maximizing one individual's utility function given that the technical possibilities are fixed *and* that the other individuals' utility functions are set at predetermined values. Thus, Lange also used the apparatus of constrained maximization but differently from Bergson. The importance of Lange's method is that it dispenses with the assumption of an underlying Economic Welfare Function in order to reach welfare conclusions.[15]

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[12]Called the "Fundamental Value Propositions of Individual Preference" by Bergson (1939, p.318). The expression "Pareto Principle" became common only after the war (under Little's influence, it seems).

[13]In keeping with the mathematical style of his time, Bergson used only intuitive arguments to conclude that the second-order conditions were satisfied.

[14]I will be brief on Samuelson's welfare economics. Chipman (1982) discusses it in admirable detail.

[15]There are further methodological differences between the two papers. Bergson is concerned with classifying the welfare conclusions in terms of various "value judgments", while Lange tries to distinguish them in terms of their "operational significance".

Social choice theory has an immediate connection with Bergson's version of welfare economics, but not with Lange's. It is no coincidence that the latter is mentioned only in passing in Arrow's 1951 book, while the former is the target of an elaborate argument. Remarkably, after pointing out the wide generality of his notion of "social choice" in chapter I, Arrow chose in chapter III to specialize it to welfare economics. In this chapter, he introduces his famous conditions[16] not in full generality, but in terms of a "social welfare function", and the latter is said to share important features with Bergson's own function. The argument started here about Bergson will extend throughout the book - it recurs in the next chapter on the Compensation Principle and culminates in chapter VI. At this juncture, Arrow goes beyond the initial claim that Bergson's function is *analogous* to one of his "social welfare functions". It is in effect *identical* to one of them, with the striking consequence that the impossibility theorem applies:
"Mathematically, the Bergson social welfare function has ... the same form as the social welfare function we have already discussed ... Hence, the Possibility Theorem ... is applicable here; we cannot construct a Bergson social welfare function ... that will satisfy Conditions 2-5 and that will lead to a true social ordering for every set of individual tastes" (1963, p. 72).

This is a crucial passage to understand the connections, both historical and logical, between the new welfare economics and social choice theory. On a few occasions in the book, Arrow even goes beyond the stage of rejecting Bergson's particular version of the new welfare economics. He also claims that his refutation of Bergson implies that the search for optimum conditions is meaningless.[17] But there cannot be a straighforward implication from one to the other. We have just seen that Lange's derivation of the marginal conditions does not depend on assuming a "social welfare function"; hence it is immune to Arrow's critique. One interpretation of Arrow's claim is that he views the study of the General Optimum as being *only a preliminary stage* in the construction of an Economic Welfare Function. This is a view that I find hard to defend. If Arrow

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[16]Universal Domain, Positive Association, Independence of Irrelevant Alternatives, Non-Imposition, Non-Dictatorship, plus the Social Ordering assumption included in the very definition of a social welfare function. For simplicity, I will use the slightly different set of five conditions: Universal Domain, the (Weak) Pareto Principle, Independence of Irrelevant Alternatives, Non-Dictatorship, Social Ordering. This set of conditions has emerged from the 1963 version and become standard afterwards. Sen's treatment (1970) follows this line.

[17]"We may go even further than Samuelson and doubt that any study ofmaximal alternatives will actually be useful in studying those aspects of social choice which are directly related to consumer's (and worker's) choice" (1963, p.37). The same idea is put forward in (1963, p.63-64) where, however, it is significantly qualified.

had really adhered to it, the work he did in the fifties on the the two fundamental welfare theorems would have been – it seems - pointless.[18] Clearly, the marginal conditions have an interest by themselves, even if they do not inform us about the difficult cases, such as those involving complicated externalities and those calling for distributional considerations. I am returning now to the critique of Bergson. At a later point I will come to the Compensation Principle, which provides another relevant link between welfare economics and social choice theory.

5. The social-choice-theoretic critique of welfare economics: the Arrow-Bergson connection disentangled

Arrow's final rejection of Bergsonian welfare economics entirely depends on establishing that the Economic Welfare Function is not only related to, but in effect identical with, a "social welfare function" in his sense. This conclusion depends on three steps, the first and the second of which are unproblematic. The first step is purely semantic. Arrow's "social welfare function" comes with a privileged interpretation of individual preference relations - they are meant to represent the individuals' evaluations of social states, as influenced by their "values". Bergson, and welfare economists generally, analyze social states in terms of individual consumptions and supplies of factors, and their notion of a utility function is meant to reflect the individual's ordinary, unelaborate preference - his "tastes" as opposed to his "values" in Arrovian terminology. As Arrow points out, this semantics can be accommodated by the "social welfare function" viewed as a purely formal object. Where an objection could arise, however, is with the Universal Domain condition. If "tastes" are construed according to standard microeconomics, i.e., as preferences varying positively with consumption and negatively with labour expended, and depending on nothing else, there is a restriction on the set of available preference profiles. Hence a second, purely logical step, which consists in showing that the impossibility theorem holds for the accordingly restricted domain assumption ("Possibility Theorem for Individualistic Assumptions", 1963, p.63).[19] In the sequel I will refer to this relevant domain assumption as Modified Universal Domain.

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[18]Interestingly, Arrow's major contributions to Paretian welfare theory take place roughly at the time of *Social Choice and Individual Values*. See his *Collected Papers*, vol. 2, especially ch.2.

[19]This variant result justifies the earlier cryptic comment in the book that "the current analysis of maximal social states is applicable precisely when it cannot serve the function of a preliminary to a complete enumeration of the social ordering" (1963, p.37).

The ground is now cleared for the third and only really problematic step, i.e., to defend each of the conditions – Modified Universal Domain, Independence of Irrelevant Alternatives, Pareto or related conditions, Non-Dictatorship, and Social Ordering - in terms of the general objective and privileged interpretations of welfare economics. Arrow (1963, p.73) is disappointingly brief when it comes to this fundamental discussion. Basically, he contents himself with pointing out again the general plausibility of his conditions.

Not surprisingly, the welfare economists plunged into the breach. While conceding that the theorem was perhaps applicable to politics,[20] they would claim that it is irrelevant to their field. "We must conclude that Arrow's work has no relevance to the traditional theory of welfare economics, which culminates in the Bergson-Samuelson formulation", said Little in (1952, p.141). "I agree with Little in barring Arrow's theorem from welfare economics", added Bergson in (1954, p.247). Two major points were made. I will take up each of them in turn.

The first point was that the very notion of a social welfare function, as defined on a *set* of many preference profiles, made no sense in welfare economics, and similarly for the conditions involving comparisons between two profiles. It was argued that welfare economics was restricted to *given* individual tastes, which meant, in Arrow's framework, a unique preference profile. According to the argument, welfare economics comparisons bear on changes in either the physical variables, such as individual consumptions, or the technological parameters, such as the firms' production functions. There is no sense in trying to extent these comparisons to cases of preference changes. When the Bergson function is decomposed in terms of the individual utility functions, it must be well understood that the latter are kept fixed. In other words, the Economic Welfare Function is a function of functions only in the sense of a composed function, not of a functional.[21]

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[20]The political interpretation is critically discussed in Little (1952), Bergson (1954) and Samuelson (1967). It is taken up in late textbooks on welfare economics as a kind of compromise between Arrow and the welfare theorists. An elaborate example is Feldman's (1980) text. It relates the Arrovian framework to the second welfare theorem as follows. The politically interpreted social welfare function decides *which* of the many Pareto optima should prevail; then the second welfare theorem is invoked to conclude that the selected Pareto optimum can be achieved as a competitive equilibrium.

[21]Take Bergson's Economic Welfare Function:
$E = E\,(x_{11},..., x_{1m}, l_{11},..., l_{1m},...,x_{j1},...,x_{jm},l_{j1},...,l_{jm},...,x_{n1},...,x_{nm},l_{n1},...,l_{nm})$,
where $x_{j1},...,x_{jm}$ are the amounts of the m commodities consumed by individual j, and $l_{j1},...,l_{jm}$ are the amounts of labour expended by j in each of the m departments of production. Now

As it turned out from later discussions, this line of defence is a weak one to take. To *define* a "social welfare function" on a set of many preference profiles would be immaterial if the conditions imposed on the function did not involve comparisons between several profiles at a time. This observation reduces the scope of the disagreement to the conditions themselves, and specifically to the subclass of those conditions which are involved in the making of "interprofile" comparisons. The 1951 version had one too many of those problematic conditions; it disappeared from the neater 1963 version.[22] What remains open to the welfare economists' objection is Independence of Irrelevant Alternatives as well as Universal Domain: The latter provides the stock of profiles between which the former allows one to make comparisons. But the work done by social-choice theorists in the seventies established that both Independence and Universal Domain could be replaced by conditions stated for a *single* profile, leading to reproduce the negative conclusion of Arrow's theorem in this less controversial framework.[23] I will denote these "single profile" analogues of the initial conditions by Universal Domain* and Independence*. Universal Domain* is satisfied by welfare economics, given the standard assumptions of this theory. Independence* is more difficult to interpret. However, this difficulty should be reserved for a separate discussion; the initial condition of Independence was also open to several interpretations or objections. Dealing with the welfare economists' first major point, I can record the following result: They made a big deal of an issue - "single profile" versus "multi-profile" social evaluation - which proved to be a merely technical one. If something goes wrong with the social-choice-theoretic critique of welfare economics, it cannot have anything to do with that issue, but with the significance of the conditions in either framework.[24]

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applying the Pareto Principle ("Individualism" in Bergson's terminology), we conclude that E can be written as:

$W= W\ (U_1(x_{11},..., I_{11},...),...,U_j(x_{11},..., I_{11},...),..., U_n(x_{11},..., I_{11},...))$.

The welfare economists' point is that only the variables of the U_j, not the U_j themselves are allowed to vary.

[22]Positive Association, which is superseded by the familiar Pareto condition in the 1963 version and later texts. By targeting at Positive Association, Little (1952, p.141) shooted in the wrong direction.

[23]By order of historical precedence the relevant papers are those of Kemp and Ng (1976), Parks (1976) and Pollak (1979).

[24]In retrospect this conclusion can be reinforced. A broad lesson that can be drawn is that few results (be they positive or negative) are lost when one moves from the multi- to the single-profile approach. It is just mathematically easier to work within the former, which explains why a number of social choice results first came in this form. For more on this see Roberts (1980).

The second major point made by the welfare economists, notably Little (1952) and Bergson (1954), is that their Economic Welfare Function should not to be interpreted as expressing the society's ordering but only an ordering relative to the society. But then, whose ordering is it? Arrow's opponents insist that it must be *a person's*. The welfare economist views himself primarily in the role of a consultant. He counsels officials who are to make large-scale decisions. He also counsels the ordinary citizens who are willing to employ him in order to decide, say, whether or not they will support a tax reform. Whichever is the case, the argument continues, welfare analysis relates to a person like you and me, not to a collective entity. The person will communicate his evaluative judgments to the welfare economist, who should be able to summarize them into a *coherent* criterion, i.e., an ordering. The conclusion that the criterion is coherent is compelling, because we are here talking of a person, not of a collective entity, and the usual rationality considerations apply unproblematically at this level.

This forceful answer would seem to cut the ground under Arrow's feet. I am not aware of an explicit rebuttal in the literature, which makes it worthwhile to offer one here. One version of the argument is easy to rebut because it involves a serious confusion about methodological individualism. The welfare economists claimed in effect that collective entities ("the community as such", Bergson, 1954, p.243) did not *exist*. But it has been argued repeatedly and, I think, convincingly that methodological individualism is not the thesis that collectives do not exist. It is rather the (weaker) thesis that they cannot been automatically endowed with well-defined aims or objectives. Methodological individualism is a way of allocating the burden of proof. When it comes to firms or nations, the burden of proof is on whoever claims that there is such a thing as the firm's objective function, or the nation's long-term interests. From this cursory discussion I conclude that methodological individualism supports - if anything at all - the programme of investigating the conditions under which collective objectives can be defined, starting from the data of individual objectives. This is the programme of social choice theory broadly speaking.

Here is a further counter-argument. Even granting the welfare economists' premiss that the welfare ordering is a person's ordering, there are difficulties for their position. It amounts to discarding all of Arrow's conditions but one, i.e., the Social Ordering condition. A priori, the client might be of any ethical type. He might not even accept the Pareto Principle and Non-Dictatorship. But if this is so, what is the role of welfare economics? It is reduced to the menial task of

explaining how to maximize a function, whatever it is, under predetermined constraints. Surely, welfare economists have a higher opinion of their field. What led them astray is the implicit assumption that to form an ordering from the client's data is a trivial step. If one takes the "economist as consultant" picture at all seriously, one must extend it to the *construction* of the ordering. This richer description eschews the charge of triviality. It is only at the construction stage that the traditional commitments of welfare economics - i.e., the Pareto Principle, and arguably Non-Dictatorship[25] - enter the picture. But then, social choice theory becomes relevant since it addresses the question of how to construct a welfare ordering for the client. Arrow's specific conditions, or rather the related single-profile conditions, are also relevant, at least *prima facie*. They might be dismissed at the end of the day, but there is a sense in saying that they belong to theoretical welfare economics.[26]

The welfare economists' arguments relied not only on the two theoretical arguments which I have tried to dispose of, but also on invoking the tradition of their field. For instance, in the same passage I quoted from, Bergson wrote: "I have thought here to make explicit that this follows simply from the very nature of the discipline" (1954, p.247). From all I know, this remarkable pronouncement is unwarranted by the history of the subject. Admittedly, the notion of the economist as a "counsellor" of individuals is a commonplace of pre-war economics. But I do not think that the welfare economists believed that the whole of their field should be reorganized around this single theme. It cannot accurately capture the objectives of normative economics which, is, to repeat, primarily an exercice in *evaluation*, and only derivately a system of *recommendations*. I do not think either that the welfare economists would really construe the theme as narrowly as it was construed in the previous argument.[27] To the contrary, there is evidence that: (a) more often than not, they intended the "client" to be the collective entity, whatever that meant for them;[28] and (b)

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[25]As Alain Trannoy pointed out to me, the "client" scenario seems to be compatible with accepting the possibility of dictatorship. Bergson (1954, p.237) indeed claimed that Non-Dictatorship should be reserved for the political interpretation of Arrow's theorem. But this move would make vacuous the welfare economist's commitment to the Pareto principle. It leads back to the unsatisfactory view that the welfare economist helps his clients to maximize their utility functions, whatever these functions may be.

[26]Compare the argument of this paragraph with Arrow's discussion of *individual* distributional ethics ("the ethics of Primus") in his *Collected Economic Papers*, vol.1, ch.3, p.55-56.

[27]Robbins (1932) might have. But he is not a welfare economist, and his positions were often regarded as extreme by the writers of the new welfare economics.

[28]Evidence for this claim can be found in Lange (1942) and even more clearly in the debate over the second welfare theorem and the economic theory of socialism.

they were concerned with the construction of the Economic Welfare Function, even though they would as a first approximation take it as given.[29]

To put it bluntly, the new welfare economics was groping after something like Arrow's aggregation problem, especially in the late pre-war formulations.[30] By denying this, the welfare economists have reformulated their enterprise in a bizarre way, which could not enhance its prestige among the general economists. I submit that their defensive move has decisively contributed to the decay of their field in the post-war years. Also by denying this, the welfare economists have been distracted from offering a serious critique of Arrow's or related conditions. Even at a late stage, there was no fruitful discussion of those single-profile versions of the impossibility theorem which I have just shown are directedly related to the "Bergson-Samuelson welfare function".[31] This is too bad for welfare economics.

To return to the notion of progress, consider again requirement (1), i.e., that T' should provide a solution to at least one unresolved problem of T. In the previous discussion, the word "problem" has come to mean two things. I suggested that the *general* problem of aggregating individual utility functions was nearly explicitly part of the conceptual background of the new welfare economics. The *specific* problem created by the impossibility theorem was of course invented by social choice theory, but given that the general problem was in the air, it must count as a problem also for welfare economics. I should precisely state what the specific problem was. I submit that the following version of the impossibility theorem is appropriate: "a Bergson-Samuelson welfare function which is not based on interpersonal comparisons of utility is dictatorial". This version is not Arrow's. It is single-profile, and based on Universal Domain* and Independence*. Not only does it deflect the objection raised against Arrow's multi-profile framework, but - most importantly - its Independence* condition can be interpreted as rendering the assumption that interpersonal comparisons are *not* made. Given this interpretation, all the conditions are acceptable to the welfare economists. They lead to the unpalatable conclusion of dictatorship - admittedly a less shocking conclusion in the single-profile than in the multi-profile context, but an unpalatable conclusion nonetheless. Now, how does

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[29]Clear evidence for this can be found in Bergson himself (1938, p.323).

[30]Arrow (1983, p.26) puts it this way: "Social choice theory was a child, if unwanted, of the Bergson-Samuelson social welfare function viewpoint."

[31]Samuelson's (1976) restatement in reply to Kemp and Ng (1976) unfortunately confuses the issues.

social choice theory resolves the problem thus created? In one sense, the logical statement of impossibility by itself constitutes a "solution"; in another sense, the "solution" would be to make interpersonal comparisons in some specific way. I will return to this ambiguity after discussing the Compensation Principle.

6 - A word on the Compensation Principle

The famous Compensation Principle of the new welfare economics provides a link with social choice theory which has perhaps attracted even more attention than the Arrow-Bergson debate. However, I view it as conceptually less significant than the latter, for reasons that need spelling out. In a nutshell, this is because the critique of the Compensation Principle does *not* have to rely on using the impossibility theorem - contrary to the critique of Bergsonian welfare economics, which absolutely needs it.

It is a familiar story to the economists. The compensation tests attempted to extend the range of welfare judgments permitted by the Pareto Principle by taking into account the possibility of the gainers' compensating the losers. The Kaldor-Hicks test was inconsistent in the sense of leading to cycles, actually obvious cycles of order two, but Scitovsky's more sophisticated "double test" pretended to remedy this defect. Arrow argues that the Scitovsky test is also inconsistent.[32] The logical skeleton of his refutation is this. The binary relation implied by the Scitovsky test is incomplete; a natural way to make it complete is to declare two states *x* and *y* indifferent with each other if the test is conclusive neither for *x* against *y*, nor for *y* against *x*. However, indifference defined that way turns out to be intransitive, as a three-alternative example demonstrates (1963, p.45). This fairly straightforward piece of reasoning stands by itself, regardless of the impossibility theorem.

Although Arrow does not do it explicitly, it is possible to base a refutation on his impossibility theorem. Take *any* binary relation R having the following two properties: first, it extends the partial ordering implied by the Pareto Principle; second, it is complete. If R is obtained from a "social welfare function", then assuming the Arrovian conditions other than Social Ordering, we conclude that R *must* be intransitive. This sounds like a powerful critique because it does not depend on the particular way of making the Scitovsky relation complete, in

[32]In point of scholarship, I do not know whether Arrow was preceded in his refutation of Scitovsky.

contradistinction with the previous argument. It does not even depend on selecting the Scitovsky relation in the first instance, and can thus be offered as a refutation of the Compensation Principle *in general*. However interesting it might be, the argument through the impossibility theorem seems unnatural because the Scitovsky test falls prey to a much simpler argument. This probably explains why Arrow chose to dismiss the Scitovsky test by means of a numerical example, and not in terms of the abstract argument just sketched.

Even if Arrow did not say it in so many words, there is a sense, both formal and conceptual, in which the impossibility theorem *explains* the failure of the compensation tests. Their motivation was to go beyond the Pareto criterion while still avoiding making interpersonal comparisons. Arrovian results teach us that this is an impossibility as soon as one insists on certain conditions, among which that of a complete ordering extension of the Pareto partial ordering.[33] This connection means good news for my thesis that the latter is progressive with respect to the new welfare economics. In the forties, the cyclicity of the Compensation tests was construed somewhat like an *anomaly* accompanying an essentially sound theory. Given this construal as an anomaly, we have another successful application of requirement (1) in the definition of progress, and actually a neatly different one from the previous application to Bergsonian economics. Notice the particular notion of a "resolution" involved here. It consists in showing that there cannot be a solution in the sense dreamt of by the welfare economists – a purely negative sense of the word "resolution".[34]

7 - Social choice theory and the conditions of progress

Thus far, I have been mostly busy arguing that requirement (1) was met. Both to buttress this claim and reach a similar conclusion for conditions (2) and (3), I should pause and discuss the sense in which social choice theory can be said to *resolve* problems. Typical responses to Arrovian impossibilities involve either pursuing Arrow's main suggestion in 1951, i.e., weakening the Unrestricted

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[33]It seems fair to emphasize this restriction. Perhaps the inventors of the Compensation Principle did not have only *complete* extensions in mind; this would make their case a little more promising.

[34]It is instructive to compare the Arrovian arguments discussed here with Chipman and Moore's (1978) refutation. These authors establish that each test, including Scitovsky's, is cyclical by constructing general equilibrium positions. Arrow's numerical example or the more roundabout argument through the impossibility theorem delivers the same conclusion without satisfying this economic constraint. The Arrovian refutation is in accord with the social choice framework, while Chipman and Moore's is more obviously *internal* to the new welfare economics.

Domain assumption, or adopting Sen's (1970, 1982) and his many followers' method of introducing interpersonal comparisons. (In social choice theory, until recently, the Pareto Principle has been regarded as unassailable.) Which road to choose depends on the intended interpretation. In terms of the welfare economics interpretation, the first road is a dead end. This much was already suggested by my discussion of Universal Domain*. The technically refined work which has consisted in exploring highly structured "economic domains" by and large supports the claim that Arrow's theorem is robust to domain changes.[35] The welfare-oriented social choice theorists have usually explored the second road, and meanwhile formalized particular ethical criteria some of which are completely standard (e.g., utilitarianism), others not so (e.g., Nash's product of utilities).[36]

The sense in which these exercises are problem resolutions is ambiguous for the following reason. Many social choice theorists are concerned mostly with exploring the compatibility or otherwise of given normative assumptions, without taking side strongly for or against them. They might point out that a condition is apparently acceptable, or open to criticism, but they would refrain from entering a proper normative debate. For instance, to solve the problem created by an impossibility result typically means for them to taxonomize and logically explore the ways of circumventing the impossibility, ideally by turning it into one or more positive characterizations. Their official notion of problem-solving is a *formal* one.[37] As an important application, it includes the case in which a previously raised problem is shown *not* to have any solution, as with the Compensation Principle. However, other theorists (like myself) believe that normative commitments are both unavoidable and desirable, and conclude that the ethical discussion is a very substantial part of the social choice exercise. For this group, solutions are given at the *substantial* level of normative decisions made for or against a condition, while taxonomies or conditional statements play the role of preliminary groundwork. It is important to realize that the two groups overlap massively in their ordinary work, even though they would disagree when asked to make their methodological positions clear. Some contributions are clearly purely formal, others are clearly substantial or at least offered as such. But a good deal of the puzzle-solving activity in the field falls in between.[38]

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[35]See Le Breton and Weymark's (1996) survey of "economic domains".

[36]See the surveys in d'Aspremont (1985), Sen (1986), Mongin and d'Aspremont (1998), and Bossert and Weymark (forthcoming).

[37]For a good example of this methodological stance, see Fleurbaey (1996, ch.1).

[38]More on this general discussion in Mongin (1999).

How does this sketch compare with what we know of the new welfare economists' attitude towards normative commitments? They were wary of certain "value judgments" and willing to indulge in others. They took the Pareto Principle to be both normatively commendable and indispensable, and they regarded judgments of interpersonal comparisons as being both normatively dubious and dispensable. These two *substantial* commitments defined a range of acceptable problems for which solutions could be sought. Within this range, solutions were mostly offered at the *formal* level, as is apparent, I think, in both Bergson's work and the original papers on the Compensation Principle. Comparisons of the new welfare economics with social choice theory may not be too difficult to implement if we are careful to limit them to problem-solving activities of the same type.

This warning helps to put into proper perspective requirements (1) and (2). For what it is worth, Bergson's Economic Welfare Function is a formal device; so it is appropriate to compare the problem it raised with the following solution: "either accept interpersonal comparisons of welfare, or give up the Economic Welfare Function". The solution is stated at the same level of generality as the Function itself; there is no need to specify *which* interpersonal comparisons should be made. It is a truly informative resolution, and if it had been absorbed by the welfare economists, it would have reoriented their theorical work entirely. This completes the discussion of requirement (1). I think (2) can be fulfilled along similar lines, while taking into account the important fact that a good deal of the new welfare economics was diverted to public economics from the 70's onwards. The formal analysis of the General Optimum, and the way its conditions are realized by the markets or call for correctives - all this really belongs to public economics by now.

Both formal and substantial resolutions are welcome to count for the fulfilment of (3). This requirement is most easily satisfied by mentioning the wide range of problems in the "theory of committees" that the social choice theorists both raise and solve, most often formally, but sometimes also substantially. These problems were clearly outside the initial range of the new welfare economics (and not only outside its *ex post* redefined range, once Arrow had come!). It is fair to recall at this juncture that modern social choice theory results not only from Arrow's pioneering book, but also from Black's *Theory of Committees and Elections* (1958) and earlier articles on the same topic. Alternatively, I could have stayed close to Arrow's initial contribution by mentioning the variant

proved by Gibbard (1973), a justly famous result which opened up a whole new area of work - i.e., the nonmanipulability of social choice decisions.[39]

8 - The assumptions of welfare economics and the fourth stage of normative economics

Although the main point has already been argued, i.e., that the third stage was a progressive one, I would like to take a broader view of my topic and briefly reexamine the basic assumptions of welfare economics. As will become apparent, the point is to relate them to the *current* work, i.e., what was tentatively called the fourth stage of normative economics. This will lead me to clarify, and actually qualify, the sense in which the third stage was progressive.

Welfare economics relies on conceptually loaded assumptions that have become better and better understood, and actually more and more heatedtly criticized, with the passing of time. The following list is an attempt to capture them. I state them in terms of the ideal concept of normative economics that welfare economics is supposed to encapsulate.

(I) Normative economics is an exclusively teleological theory. That is to say, it will select a notion of the social good, and it will make all its evaluations and derived prescriptions dependent on this chosen notion.

(II) The chosen notion of social good is social welfare. Social welfare is initially an undefined term in normative economics. It will be explicated in terms of the next conditions.

(III) Social welfare in any circumstances is entirely determined by the data of individual welfare given these circumstances, and it increases when these data show an increase in individual welfare. Normative economics makes this claim precise in terms of the Pareto Principle, as interpreted in welfare terms.

(IV) Normative economics is concerned with a particular notion of a social state. Only economic variables enter the description of the states.[40] (In effect, the economic variables to be taken into account are the quantities of commodities

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[39] A methodological dispute is likely to take place in connection with this and related examples. Some writers in normative economics (e.g., Fleurbaey, 1996) appear to believe that non-manipulability, and others implementation concepts, belong to an area different from normative economics. As they construe it, the latter is concerned solely with norms and evaluations, not with the way in which they can be achieved in the economy. I see normative economics as being concerned also with implementation issues, even if I am emphasizing here the purely normative stage.

[40] This can be formally explicated by assuming that non-economic variables are *separable* from economic variables within each individual welfare function. This is not a light assumption to make.

consumed and of factors supplied by the individuals. The commodities may be either private or public goods.)
(V) Individual welfare can be measured by an index of preference satisfaction.
(VI) The index of preference satisfaction summarizes the individual's choice behaviour ("revealed preference theory").
(VII) The index can be endowed with the standard properties of an ordinal utility function. For each individual, it varies in the obvious direction with this individual's quantities of goods and factors. The familiar non-satiation and convexity conditions may be imposed. The assumptions will have to be suitably modified when it comes to risk and uncertainty, but again by borrowing standard microeconomic construals (such as the von Neumann-Morgenstern utility function).
(VIII) The index is not comparable from one individual to another.

This is a rough picture, but it is sufficient for the conceptual discussion.[41] Welfare economists generally do not disentangle (V) from (VI) because they take "revealed preference theory" for granted. Then, the statement corresponding to (V) and (VI) jointly goes like this in welfare economics:
"A person's welfare map is defined to be identical with his preference map - which indicates how he would choose between different situations, if he were given the opportunity for choice. To say that his welfare would be higher in A than in B is thus no more than to say that he would choose A rather than B, if he were allowed to make the choice" (de Graaff, 1957, p.5).[42]

All of these assumptions can be, and indeed have been, called into question, either jointly or separately. Take (V) and (VI) together. For sure, welfare economists know that maximizing behaviour in the revealed preference sense does not have the same meaning as maximizing behaviour in the welfare sense. What they intend to say is only that the former can serve as a *measure* of the other for the purpose of the theory. Presumably, this is the reason why de Graaff employs the word "defined" in the previous quote. Then, domain considerations should come to the forefront. The (purely extensional) coincidence of the two kinds of behaviour can only be justified by appealing to the particular notion of social states in welfare economics. This means that we

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[41] It has sometimes been said that welfare economics needed only to make assumptions about *variations* in individual and social welfare; see Little (1950). I discard this line of analysis partly for simplicity, partly because it does not seem very plausible to investigate variations in a quantity without saying what the quantity refers to.

[42] Compare with related statements in Boadway and Bruce (1984, p.8), Little (1950), Mishan (1969, p.23-25), Winch (1971, p.33-34).

should really consider (V) and (VI) jointly with (IV). But even in this charitable reading, the claim is more than dubious. Suppose that I have to choose between various baskets of apples and bananas, a matter relevant to the "economic" notion of a social state. From the fact that *x* is my chosen basket, and *y* is not, the welfare economist still cannot infer that my welfare would be lower in *y* than it is in *x*. This is a *non-sequitur*. They may be all sorts of reasons why I choose *x* instead of *y*, not all of them have to do with my welfare. Quite trivially, my tastes for apples and bananas might induce me to choose a basket with, say, too many bananas for my welfare. Some will perhaps be tempted to reply that non-welfare reasons show up as violations of the consistency of choices, but this would be a gratuitous assumption to make. A more standard reply is this. One cannot say that I am choosing too many bananas for my welfare if I really *choose* to have this basket. But this is tantamount to saying that, after all, welfare *is* the same thing as choice - a claim that was discarded at the outset as implausible. Notice that the familiar contention, "people are the best judges of their own interest", is not sufficient to warrant the conclusion that choices provide a measure of welfare. The claim may be true without the people's good judgment surfacing in their choices.

One way or another, the critique just sketched has been made a number of times.[43] What I want to stress is the methodological point that this seemingly commonsensical critique has entered normative economics only recently. It is not well taken by social choice theory, which generally has little to contribute on *the interpretation* of the preference concept. For most social choice theorists, preferences are just preferences, whatever that means; and if they are pressed to provide an interpretation, they might very well follow the welfare economist into the trap of "defining" welfare by choice.[44] It is really only in the work currently pursued about nonstandard indexes of welfare, especially in connection with Sen's (1985) "functionings" and "capabilities", that the critique above has become broadly understood.

A different (and more sophisticated) critique of welfare economics results from focusing on (IV) and (V), while putting (VI) aside. To relate an economic notion of welfare to *any* concept of preference raises possible objections. Sen (e.g.,

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[43] I found out that it had already been made by the philosophers (not the economists!) participating in the conference *Human Values and Economic Policy* (1967). Further occurrences are, among others, Broome (1978), Sen (1985), Mongin and d'Aspremont (1998).

[44] I sadly noticed that this happened again at the latest meeting of the Society for Social Choice and Welfare in Vancouver, 1998.

1979, 1985) usually carries his critique by considering *actual* preferences - "tastes" in Arrow's terminology. But it is possible to give a chance to the notion of *improved* preference in a sense which is not "values" in the Arrovian sense, but rather preference for the individual's own good.[45]

These issues are often discussed in connection with the polysemic concept of *welfarism*. In Sen's and others' work, the notion usually refers to the claim that individual utility data are both necessary and sufficient to form an index of social welfare. A drawback of this definition is that it trades on an unspecified notion of "utility", which leads to a case by case examination, with each relevant interpretation for "utility" delivering a case. I find it clearer to define "welfarism" as the claim that individual *welfare* data are both necessary and sufficient to form an index of social welfare. This position then becomes identical with assumption (III) in the list. The argument against sufficiency can be made in terms of socially undesirable aspirations, as in Hare's (1976) fanatic example or in Sen's (1970) Paretian Liberal paradox. The case against necessity is not so straightforward to argue, and might involve one's considering the pitfalls of the Pareto Principle in the uncertainty context, which would involve assumption (VII) in the discussion.[46] Actually, necessity is more commonly questioned in relation to still other implicit notions of "welfarism". One of them would go like this. "Welfarism" is the claim that individual welfare data are both necessary and sufficient in order to form *a notion of the social objective* (rather than an index of social welfare). This sense of "welfarism" is appropriate for those theorists who are willing to accept assumption (I) fully, but only a qualified version of (II).[47] The case against necessity is then expedited by taking note of highly desirable objective achievements such as good health, education, real freedom, etc. Consider finally the further variant resulting from replacing "to form a notion of the social objective" by "*to evaluate social states"*. This definition is appropriate for those who do not even fully agree with (I), i.e., those who do not believe that normative economics should be exclusively a teleological theory. The case against necessity is then made by insisting on rights, as in today's extensive literature following from another part of Sen's (e.g., 1981) work - a literature which is permeated with deontological considerations.

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[45] This sense of preference is suggested by the important work of Griffin (1986) and Harsanyi (1977). Mongin and d'Aspremont (1998, p.388-401) follow this line of thinking.

[46] See Mongin (1997).

[47] Presumably, the work on "capabilities" follows this line of thinking.

This bird-eye review was meant to support two methodological claims. First, as already emphasized, the argument against the new welfare economics had to wait far beyond the beginning stage of social choice theory in order to be properly sorted out. I mentioned Arrow's occasional anticipation of a far-reaching critique of the new welfare economics, i.e., a critique which would hit not only the Bergsonian Economic Welfare Function, but the Paretian core of welfare economics. Whatever Arrow's meaning was in 1951, I do not think that he fully had the conceptual means of pursuing this critique. The current discussions of "welfarism" help to formulate it more appropriately. Second, there is a kind of reciprocal to the previous claim. The current discussions are best reorganized within the framework of a step-by-step refutation of the new welfare economics – even though the latter is old hat for today's readers. Precisely because they embody an intermediary stage of critical thinking, the Arrovian and post-Arrovian theories of the 50-70's are *not* a good polemical target to choose for "post-welfarist" writers. It is better to shoot at a theory which is blunter about its conceptual commitments.

This brief excursion into the fourth stage teaches us something about the pace of progress in normative economics. It is both slow and irregular. We saw that it took about twenty-years for social choice theory to produce the ("single-profile") technical variant of the impossibility theorem that would fill the gaps in Arrow's initial argument against the Bergson-Samuelson function. What we have seen in this section is that progress may be better appreciated by comparing a theory not with its immediate predecessor, but with an earlier theory. It is as if problems had a life of their own, some of them being quickly clarified, while the others drag on for years. But time has now come to reconsider the definition of progress tentatively offered at the beginning of this paper.

8 - Conclusions and further elaborations

By way of conclusion, I return to each the three conditions and discuss possible qualifications or refinements. Consider requirement (1). The Arrow-Bergson connection probably illustrates how this condition is typically encountered in normative economics. Cases of recognized anomalies for T are sparser than cases of disturbing novel facts pointed out by T'. We should then expect the T theorists to deny what the T' theorists claim, i.e., that there is a problem *for* T. To pass a judgment nonetheless, we need to complement requisit (1) with an *external decision procedure*. What I have done in effect is to consider the theoretical background of T, i.e., its theoretical language and intended

interpretations. If the problem could have been formulated in the theoretical language, and if once formulated, it would haven fallen within the range of intended applications, the debate is settled for T'. I claimed that a suitable version of the impossibility theorem fitted this description. This claim involved me in some history of economic thought. Historical research is bound to play a role of arbitration since each camp will invoke "the tradition of the field" against the other.

Consider now condition (2). It is disappointingly vague to mention only the *main* problems addressed and solved by T, but I see no way of improving on this part of the definition. Here is another feature that is worth stressing. The requirement that T' should continue to solve the main problems that T had solved is good enough to ensure continuity, but not to exclude that dubious resolutions will be perpetuated. In the empirical sciences the corresponding requisit - roughly, that T' recovers most of the corroborated content of T - ensures, at least in principle, that what is common to T and T' is also what is valuable. Of course, the contrast must not be overdone. Corroboration is arguably never definitive - and some problem resolutions can be. But there remains a substantial disanalogy, and it might indicate that only progress "in the small" - not progress "in the large" as in grand science - is really feasible for normative disciplines. Given the conceptual difficulties - actually, the mass of confusions - that social choice theory unconsciously borrowed from the new welfare economics, the progress from one to the other is more limited than my account of the brilliant Arrovian episode suggested. The sketch of the fourth stage has served to temper the initially enthralling picture.

Concerning (3), I will only mention that this condition does not insist on originality, at least in the following sense. It is sufficient if traditional conceptions are *made by T' to bear on the given problem*. The way in which social choice theory has dragged again the time-honoured rule of utilitarianism into welfare discussions is an example to the point.[48] There is a loose analogy between the claim made here about originality and a view that surfaced in the earlier philosophy-of-science discussion of novel facts. Against Lakatos's "temporal" view of evidence, it was argued – successfully, I believe - that a new theory could be corroborated by evidence already known before it came into existence.[49]

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[48]Hammond (1982) and other contributors to the same volume emphasize that this rule is very much alive in public economics.

[49]See Zahar (1983) and Worrall (1985).

Here is a last point, or rather a warning, I would like to make. Welfare economics died, or rather disintegrated progressively, for many different reasons, some of them are unconnected with the emergence of a progressive alternative theory. The post-war years seemed to have witnessed an increasing discontent with its policy conclusions. Thus, the "theory of the second-best" introduced after the war by Lipsey and Lancaster (1956) cast doubt on the relevance of the marginal conclusions as well as the analysis of the Optimum more generally. The lasting achievements of the new welfare economics proved dubious after all, even to those who were *not* impressed by Arrow and his style of theorizing. This suggests that one should be clear about the following distinction. There is a difference between claiming that conditions (1), (2) and (3) apply with some dose of success to the historical development of normative economics, and claiming that these conditions provide the *causal factors* accounting for this development. The rational reconstruction of normative economics I have attempted here is itself evaluative, and does not by itself make causality claims. But hopefully, it suggests relevant conjectures to test. It is now for the historian of economics to enter stage.

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