IS THERE PROGRESS IN NORMATIVE ECONOMICS?[*]

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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 comments about the more recent developments in normative economics and their connection with the previous two stages.

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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 value 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 even 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 preference satisfaction, 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 desirability or "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 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

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[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.

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 at least, this pattern is both *intelligible* and *oriented*. Many economists even believe that it is a *progressive* pattern - although they would find it uneasy to explain what they mean by that. 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 historical pattern is well-known. The "economics of welfare", as Pigou (1920) termed it, reformulated and extended the patchy analyses of the social benefits of well-functioning markets that could be found in Marshall and other early Neo-Classicals. Pigou's work is not only more focused than his predecessors', but also more *normative* in the sense of the definition I gave. Typically, it is clearer in distinguishing between the abstract conditions for evaluating economic states of affairs, and the way they apply to the market or the way they can be implemented by the State. However, when it comes to explicating his desirability concept, i.e., economic welfare, Pigou leaves the reader with insufficient guidance. As Arrow (1983, p. 18) once noted, he states optimality conditions without properly saying what his maximand is. Whatever the exact meaning of his conditions, he clearly intended them to bear not only to the efficacy of the economy, but also on the distribution of income. Hence the easy and common reconstruction of Pigou's *Economics of Welfare* as being utilitarian - a reconstruction which I believe needs scrutinizing again.[3] This old-style welfare economics is the first form of normative economics. I will leave it aside for the rest of the paper.

The so-called *new welfare economics*, which crystallized in the 1930s, corresponds to the second historical 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 either markets or economic policies. The main results obtained in these years were of course the "fundamental theorems of welfare

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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]There is a chapter on Pigou in Myint's (1942) history of early welfare theories. But *The Economics of Welfare* cries for a modern appraisal.

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.[4] Using different conceptual and technical means, the new welfare economics was pursuing a slimmer version of Pigou's programme. Officially, it put aside the evaluation of income distribution (left to the politician or the "economist qua citizen"). The so-called Compensation Principle 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 historical 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. In retrospect, the obscurities in Pigou make the transition from the old to the new welfare economics uneasy to follow, but there was an official reconstruction prevailing at the time. Pigou's successors endorsed most of his questions, but felt that they had to purge his answers from what they regarded as unnecessary strong normative commitments. In contrast, the move from the second to the third stage of normative economics occurred without such an official doctrine of continuity. Social choice theory, and later on public economics, developed in an atmosphere of crisis for the new welfare economics.

While it is often said that Arrow's *Social Choice and Individual Values* in 1951 gave a fatal blow to the work of the thirties and fourties, this claim has been disputed violently by some – Samuelson being the most famous opponent. The claim cannot be interpreted as saying 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. As set by Arrow and further clarified by Sen (1970), 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; they enter the 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. Essentially, public economics has come to absorb much of the content of the "new welfare economics" that had previously survived social-choice-theoretic criticism.[5] Thus, there are currently two, quite distinct forms of normative economics

[4]Beginners sometimes believe that the two theorems taken together form an equivalence statement. This is not the case.
[5]Such a connection is suggested in Hammond's (1990) valuable survey of the field.

being practiced in parallel. There may even be 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 to 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-80s, and public economics roughly up to now, are *welfarist*. That is to say, they take the information provided by the individuals' utility functions to be necessary and sufficient data for either the social evaluation or the public decision.[6] This was the element of continuity between the third stage and the first two, as it were. From the 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. Accordingly, some economists have 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 implications or applications, in the more traditional sense. 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 very 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.

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 sometimes well-known to the economics readers. But I will give my own twist to the

[6] Here I follow Sen's usual definition of "welfarism", which goes in terms of utility functions. An alternative definition will be employed in section 7.

[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.

familiar story. I will concentrate my efforts on social choice theory, saying next to nothing about public economics. There is much argument to be made about the former, and to decide whether the latter meant progress with respect to both old and new welfare economics would require a separate paper, which for reasons I suggested, could not be written *before* the present one. I do not think we are yet in a position to say anything definite about the last transition, but it turns out that the logic of my argument will lead me to discuss it, however tentatively. A major claim of the paper is that the transition to social choice theory was indeed progressive, but that the case against welfare economics was not properly sorted out until the last stage, which attenuates the initially exciting conclusion.

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 one of them; (4) T does not satisfy the previous conditions with respect to T'.

This definition embodies the three ideas of (1) constructive criticism, (2) theoretical continuity, (3) independence, (4) asymmetry, which 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. Importantly, the definition 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 Popperian 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 an *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 kinds of situations to occur with normative theories. It is arguable that standard ethical rules, such as utilitarianism, are accompanied with anomalies.[8] 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[9]) 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.[10]

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

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[8]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.

[9]See Popper (1963).

[10]The issue of inductivism in the non-empirical sciences is touched on by Howson (1979), who also makes suggestions on how to apply the methodology of research programmes to non-empirical disciplines like mathematics. Howson's paper is an interesting exception to the state of the art described in the introduction.

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 be related to each other in a number of ways. This is why I need (4) in order to include the commonsensical feature of asymmetry into my definition of progress. In Lakatos's framework this clause would be made redundant by the others, because of the logical relations established by the analogues of (1), (2), and (3).

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

The new welfare economics isolated and laid considerable emphasis on the problem of determining the conditions for "the general optimum", which it described as being a point of maximum social welfare. In essence, this was the problem of simultaneous maximizing the members of society's utility functions, given the interdependencies prevailing between producers and consumers and the constraints imposed on their available initial resources. 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 by Bergson (1938) and Lange (1942). Their two papers were authoritative at the time. They exemplified the new welfare economics at its best, and are therefore suitable for a discussion of progress.

Bergson takes the step of discussing the general optimum 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 factors. He just makes standard 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.[11] Bergson's contribution is to show that this thin set of assumptions is sufficient to obtain the already known conditions for the general optimum, 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

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[11]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).

rates. As Bergson also explained, more special conditions that had appeared in the past could be traced back to supplementary assumptions made on the shape of E - for instance, some of the marginal statements considered in the Cambridge tradition depended on assuming an additive form for E. Each time in Bergson's paper, the relevant marginal statements are obtained as the first-order conditions of a constrained maximization programme, in which E stands for the objective function, while the technical possibilities set the constraints.[12] Samuelson's *Foundations* (1947, p. 229-253) follows the method of discussing the general optimum in terms of maximizing a welfare function; hence the expression used afterwards, "the Bergson-Samuelson welfare function".[13] At least initially, neither author was clear about the extent to which the function required interpersonal comparisons of utility. They knew very well that the Cambridge additive function did, since it is but a variant of utilitarianism. But it transpires from their writings that they had not properly sorted out whether or not E did *in general.*

This is an important claim for the discussion to come, and a possibly contentious one, so I will provide some textual evidence. About interpersonal comparisons of utility, Bergson remains cryptic throughout his paper. He blurs the specific issue they raise by vaguely referring to the "value judgments" which he says permeate every assumption underlying the Economic Welfare Function. The only place where a "value proposition" is mentioned in connection with interpersonal comparisons occurs when Bergson discusses Cambridge (1938, p. 327). Samuelson makes some effort to taxonomize the so-called value judgments or propositions, however without casting light about the question of whether or not the function makes interpersonal comparisons (1947, p. 222-226). At some point, he explicitly says that it does:

"Without a well-defined (welfare) function, i.e., without assumptions concerning interpersonal comparisons of utility..." (1947, p.244).

Elsewhere he denies that comparisons are made. Having rewritten the Economic Welfare Function in terms of individuals utilities U^1, ..., U^n, he claims that

"if we were to change from (this) set of cardinal indexes of individual utility to another set V^1, ..., V^n, we should simply change the form of the (welfare) function so as to leave all social decisions invariant" (1947, p. 228).

Samuelson's invariance property is the exact rendering of the informal claim that "interpersonal comparisons of utility cannot be made", so this passage flatly contradicts

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[12]In keeping with the mathematical style of his time, Bergson used only intuitive arguments to conclude that his second-order conditions were satisfied, and relying as it on the differential calculus, he would not able to handle corner solutions.

[13]Arrow (1983) and Chipman (1982) discuss Samuelson's welfare economics in more detail than I will do here.

the other; and it is not the only one I could quote. So it is difficult not to conclude that Samuelson had not made his mind about the most important issue raised by Bergson's construal.

Lange's (1942) paper is the other landmark of the new welfare economics. Its second part of contains a discussion of the general optimum which follows and improves on Bergson's, but the first part of the article 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 the same conclusions.[14]

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 axiomatic conditions[15] not in full generality, but in terms of a "social welfare function", which he claims to share important features with Bergson's own function. The argument started here about Bergson extends 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).

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[14]There are further methodological differences between the two papers. Bergson is concerned with classifying the propositions of welfare economics in terms of the "value judgments" they make, while Lange follows a positivist line about welfare economics and tries to distinguish its propositions in terms of their "operational significance".

[15]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 emerged from the 1963 version and has become standard afterwards.

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 suggests that his refutation of Bergson implies that the search for optimum conditions is meaningless:

"We may go even further than Samuelson and doubt that any study of maximal 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).[16]

But there cannot be a straighforward implication from one argument 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 last quote is that he viewed the study of the general optimum as being *only a preliminary stage* in the construction of something like Bergson's Economic Welfare Function. In itself, this view would be hard to defend. Clearly, the marginal conditions have an interest by themselves, even if they do not inform us about the difficult cases, such as those calling for distributional considerations. There is a further reason to doubt that Arrow seriously entertained the strong conclusion suggested by the quote - it would imply that the important work he did to improve on the two welfare theorems was pointless.[17] I am now returning to the real object of his critique, i.e., Bergson's work. At a later point I will come to the Compensation Principle, which provides the other important link between the new welfare economics and social choice theory.

5. The Arrow-Bergson connection disentangled

5.1. Arrow's argument

Arrow's rejection of Bergsonian welfare economics 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 requires 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

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[16]The same idea is put forward in Arrow (1963, p.63-64) where, however, it is significantly qualified.

[17]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.

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 the individual's preferences varying positively with his consumption and negatively with his labour expended, and depending on nothing else, then 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).[18] In the sequel I will refer to this relevant domain assumption as Modified Universal Domain.

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 Bergsonian welfare economics. Arrow (1963, p.73) is disappointingly brief when it comes to this step. Essentially, he contents himself with reminding the reader of the general normative plausibility of his conditions - he had already argued for each of them at various places of the book. This appears to be an ineffective argumentative move. Given the task that Arrow had set for himself, he should have combined the logical use of his theorem with a specific *ad hominem* argument, to the effect that Bergson had at least implicitly accepted his axiomatic conditions.

Not surprisingly, the welfare economists plunged into the breach. Little (1952), Bergson (1954), and Samuelson (1967) conceded that the theorem was perhaps applicable to politics, although they would not feel entirely competent to decide on this, but that it was clearly 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 (1952, p.141).[19] "I agree with Little in barring Arrow's theorem from welfare economics", added Bergson (1954, p.247).[20] "I export Arrow from economics to politics because I do not believe that he has proved the impossibility of the traditional Bergson welfare function of economics", wrote

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[18]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).

[19]Baumol's early review of *Social Choice and Individual Values* had already set the pace: "This result is less disastrous for welfare theory than might first appear" (1952, p.110).

[20] Bergson (1976, p.189) repeats this conclusion nearly verbatim.

Samuelson in his famous "Arrow's Mathematical Politics" paper (1967, p. 42). The political interpretation was often taken up in later texts on welfare economics; it provided a compromise between Arrow and his opponents.[21] I will now review the main arguments that Little, Bergson, and Samuelson offered to downplay the relevance of the impossibility theorem.

5.2. The profile controversy

The first objection 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 possibilities. 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.

Some notation will help to bring the point home. Take Bergson's Economic Welfare Function:

$E=E(X)=E(x_{11},...,x_{1m},l_{11},...,l_{1m},...,x_{j1},...,x_{jm},l_{j1},...,l_{jm},...,x_{n1},...,x_{n1},l_{n1},...,l_{nm})$,

where $j=1,...,n$ is the index of the individuals, $x_{j1},...,x_{jm}$ are the amounts of the m commodities consumed by j, and $l_{j1},...,l_{jm}$ are the amounts of labour expended by j in the corresponding m departments of production. Now applying the Strong Pareto Principle ("Individualism" in Bergson's terminology), we conclude that E can be written as:

$W(U_1(X),...,U_j(X),..., U_n(X))$,

with W strictly increasing in each of its n arguments. Given the standard microeconomics assumptions, the W function is rewritten as:

$W(U_1(x_{11},...,x_{1m},l_{11},...,l_{1m}),...,U_j(x_{j1},...,x_{jm},l_{j1},...,l_{jm}),...,U_n(x_{n1},...,x_{n1},l_{n1},...,l_{nm}))$,

with each U_j being strictly increasing in its first m arguments and strictly decreasing in its last m arguments. The welfare economists were saying in effect that they allowed for variations only in either the technological constraints (not specified here) or the physical quantities entering the U_j, i.e., , but not in the U_j themselves.

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[21] Feldman's (1980) text 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 shows that the selected Pareto optimum can be achieved as a competitive equilibrium.

As it turned out from later discussions, the profile objection is not strong enough to save welfare economics from the Arrovian onslaught. First of all, 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 entail 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. Second, the 1951 version had one too many of those problematic conditions; it disappeared from the neater 1963 version.[22] What remains objectionable is the pair of conditions *Universal Domain*, in either the initial or the modified form, and *Independence of Irrelevant Alternatives*. The former conditions provide the stock of profiles between which the latter allows one to make interprofile comparisons. But, third and crucially, 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 the "single profile" analogues of the initial conditions by Universal Domain*, Independence*, and Non-Dictatorship*. They call for a comment.

The first, Universal Domain*, is automatically satisfied by welfare economics, given the wide domain of physical quantities $x_{j1},...,x_{jm},l_{j1},...,l_{jm}$ and the monotonicity assumptions made on U_j. The second condition, Independence*, is not so easily analyzed. In the present, single profile context, it is expressed as a *neutrality* condition. It stipulates that if a pair of social states x and y stand in the same relation to everybody's preferences as another pair z and w, then the social comparison between x and y should be the same as the social comparison between z and w. This condition is immediately unattractive, and Samuelson (1977) vehemently claimed that welfare economists could not accept it. However, the question was not to decide whether they *should* accept it, but rather whether or not they *had* accepted it without noticing. And here, the problem that Bergson and Samuelson had left pending becomes acute. Had they, or had they not, meant to allow interpersonal comparisons of utilities when introducing the "individualistic" economic welfare function W? The relevant fact about Independence* is that this condition is *logically implied* by the use of the W function to represent social preference, whenever W satisfies the invariance property corresponding to a social preference lacking the basis of interpersonal comparisons of utilities.

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[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]Kemp and Ng (1976) and Parks (1976) were the first to prove this result. Sen (1977), Pollak (1979), Roberts (1980) developed it further.

In his notorious reply to the social choice theorists, Samuelson (1977) started with a picturesque example to show that Independence* was unacceptable normatively, which I just said was not the point at stake, and then proceeded to argue that the *W* function did *not* make interpersonal comparisons. I read this clarification in part between the lines, because Samuelson characterizes the Bergson-Samuelson function in terms of an expression - "ordinalism" - which he never cares to define.[24] The clarification was welcome, after so much haze surrounding the "Bergson-Samuelson welfare function", but it amounted to making the latter prey to the "single profile" version of the impossibility theorem, via the Independence* condition. Samuelson flatly denied the consequence. On the interpretation proposed here, he made a blunt logical mistake. I believe that all the social choice theorists involved in the controversy would agree with this conclusion. Not every one of them took pains to offer a rebuttal, but from reading again between the lines, it appears that all believed they had won the point.[25]

One may wonder how Samuelson could make such an extraordinary mistake. My conjecture is that he was hypnotized by his normative objection against Independence*. Essentially, he thought he had gone to the bottom of the argument *once he had convinced himself that no normative economist could ever accept the condition*.[26] If this interpretation is correct, Samuelson's fault was primarily rhetoric, and only secondarily logical. Ironically, there is something in common between Samuelson in 1977 and Arrow in 1951, when the latter stopped short of pursuing his *ad hominem* argument against Bergson. They concentrated on the intrinsic merit (Arrow) or demerit (Samuelson) of claims the validity of which was not at issue – the real question being whether or not these claims had been made, or would consistently have to be made, by the opponents. Actually, the rhetorical weakness I pointed out in Arrow is more than just abstractly related to Samuelson's fault. To his excuse, he was confused by the social choice theorists, who had suggested that Independence* was an acceptable condition under at least some circumstances of political decision-making. Like Arrow, from whom they

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[24]*Prima facie*, "ordinalism" could mean two things, i.e., either that utility functions are individually ordinal and non-comparable, or that they are individually ordinal and nonetheless comparable, as in the maximin criterion of egalitarian welfare. Despite several vacillations, I understand Samuelson as adopting the former sense of "ordinalism".

[25]Kemp and Ng's (1977) reply to Samuelson pointed out his mistake bluntly. The subsequent comments by Pollak (1979), Roberts (1980), and Sen (1977) are more subdued. Neither Bergson nor Little took part in the profile controversy.

[26]If society has to allocate 100 pieces of chocolate between individuals 1 and 2, and for some reason prefers allocation (99,1) to (100,0), then, given the monotonicity assumptions about individual preferences, society should prefer allocation (0,100) to any other. This striking example in Samuelson (1977, p.83-84) makes it clear that the neutrality requisite of Independence* is unacceptable for normative economics. Samuelson's (1981, p.235-236) discussion does not go beyond his 1977 paper, i.e., it repeats the counterexample and says that it settles the matter.

drew inspiration, they were trying to kill two birds at the same time, i.e., to dispose of the "Bergson-Samuelson" function and to confirm the importance of the impossibility theorem for entirely different applications, and the latter had involved them in arguing *for* the Independence* condition.

I have not yet said anything of the third single-profile condition, i.e., Non-Dictatorship*. It is clearly less compelling that the initial condition in Arrow, and following this line, Bergson (1954, p.237) went so far as to suggest that welfare economics was not committed to it. However, the simple fact remains that, if violated, it would trivialize the welfare economists' deep-seated commitment to the Pareto principle. Here again, the strength of the conditions must be appreciated not so much in the absolute as against the background of what is taken for granted. A more detailed analysis of Bergson's roundabout reply to Arrow would confirm that he too lost sight of the structure of the debate he was taken in.

To sum up this first round of controversy, the welfare economists made a big deal of a distinction - "single profile" versus "multi-profile" social evaluation - which proved in the end to be of no help to them.

5.3. Individualism and the tradition of the field

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. Then, the conclusion that the criterion is coherent becomes 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. But if this is so, what is the role of welfare economics? It is reduced to the menial task of teaching how to maximize a function, whatever that function is, under predetermined constraints. Surely, welfare economists have a higher opinion of their field. What led them astray was 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 precisely at the construction stage that the traditional commitments of welfare economics, such as the Pareto Principle, enter the picture. But if the client scenario is so understood, social choice theory becomes relevant; it addresses the question of how to construct a "social welfare" ordering for the client. Arrow's specific conditions, or rather the related single-profile conditions, are interesting, at least *prima facie.* They may be dismissed at the end of the day, but there is a sense in saying that they belong to theoretical welfare economics.[27]

The welfare economists' arguments relied not only on the two lines of 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 was a

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[27]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.

commonplace of pre-war economics. But I do not think that the welfare economists would have followed Little and Bergson in their extremely narrow understanding of the counsellor's rôle, and I do not think either that they believed that the whole of their field could be reorganized around this single theme of counselling.[28] There is ample evidence that: (a) more often than not, welfare economists intended the "client" to be the collective entity, whatever that meant for them;[29] and (b) even if some of their results only required to take the Economic Welfare Function as given, they were also concerned with the question of how to construct it.[30]

To put it bluntly, the new welfare economics, in Bergson's formulation, was groping after something like the social choice aggregation problem. Arrow (1983, p.26) puts it in this way: "Social choice theory was a child, if unwanted, of the Bergson-Samuelson social welfare function viewpoint." By denying the fact, welfare economists reformulated their enterprise in a bizarre way, which could not enhance its prestige among the general economists. Also, because of this convenient denial, they dispensed with offering a more complete analysis of Arrow's and related axiomatic conditions. Bergson's and Little's thinking about the impossibility theorem never went beyond the stage reached in their early comments; they did not even make Samuelson's imperfect attempt to catch up with later developments. The relevant critiques, as in Sen's (1970) landmark book, were internal to social choice theory, in the reflective way which quickly became typical of this theory.

To conclude about the Arrow-Bergson connection, 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 formally state what this specific problem was. The following version of the impossibility theorem is appropriate: "the Bergson function must make interpersonal comparisons or be dictatorial" (Parks, 1976, p. 450). This version is not Arrow's. Being single-profile, it is based on Universal Domain*, Non-Dictatorship*, and crucially, Independence*, which is here the rendering of the

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[28]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.

[29]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.

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

assumption that interpersonal comparisons of utilities are not to be made. Now, how does social choice theory resolves the problem thus created? In one sense, the previous statement by itself constitutes the "solution"; in another, more practical sense, the "solution" is 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 attracted more attention than the Arrow-Bergson debate. However, I view it as conceptually less significant than the latter, for reasons that needs 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 argued that the Scitovsky test was also inconsistent.[31] 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 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*

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

general. However interesting, the argument through the impossibility theorem seems unnatural because the Scitovsky test falls prey to a much simpler argument. This probably explains why Arrow in 1951 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 underlying 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.[32] This connection is another 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 now 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 notion of a "resolution" involved here. It consists in showing that there cannot be a solution in the sense naively dreamt of; it is problem-solving in a purely negative, but entirely rigorous sense.[33]

7. Social choice theory and the conditions of progress

Thus far, I have been mostly busy arguing that requirement (1) was met, and I could have expanded even more on it. Both to buttress this claim and reach a similar conclusion for conditions (2) and (3), I should further 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 Domain assumption, or adopting Sen's (1970, 1977) 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

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[32]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.

[33]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.

exploring highly structured "economic domains" by and large supports the claim that Arrow's theorem is robust to domain changes.[34] The welfare-oriented social choice theorists have usually explored the second road, and meanwhile formalized particular criteria some of which are completely standard (e.g., utilitarianism), others not so (e.g., Nash's product of utilities).[35]

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 an assumption is apparently acceptable, or open to criticism, but they would refrain from entering a systematic normative debate. The problems they are primarily interested in solving take as their data some list of "axiomatic" conditions. Their solutions take the form of either an impossibility theorem (e.g., Arrow's conditions are incompatible) or a positive characterization (e.g., utilitarianism is characterized by such-and-such list of conditions). With this *formal* interpretation of its task, social choice theory cannot regard the latter kind of results as being more important than the former. It is true that impossibility theorems call for further investigations, while positive characterizations sound more definitive, but this very argument could be invoked to say that the former are deeper than the latter. Now, beside this, actually predominant, notion of problem-solving, there is another one, which makes the normative discussion a very substantial part of the social-choice-theoretic exercise. For the minority group, solutions should given at the *substantial* level of normative decisions made for or against a condition, while the formal statements play the role of a preliminary groundwork. With this more commonsensical interpretation of its task, social choice theory will naturally tend to deemphasize impossibility theorems; positive characterizations are what matters more.[36] After coarsely describing the two groups, I hasten to add that they overlap massively in their ordinary work. 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.

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

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

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

[36]Mongin (2001) argues that the position of the second group is not only conceptually richer than that of the first, but also to a large extent *unavoidable*, given the linguistic contraints which go with the use of normative predicates.

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 predetermined range, solutions were mostly offered at the *formal* level, as is apparent from both Bergson's 1938 article and the papers on the Compensation Principle in the thirties and forties. 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 entirely formal solution, "either accept interpersonal comparisons of welfare, or give up the Economic Welfare Function". This resolution is stated at the appropriate level of generality; there is no need to specify *which* interpersonal comparisons should be made. It is truly informative, 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.

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 work 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.[37]

Given the rearrangement of normative economics into two divisions, it is not difficult to argue that the asymmetry condition (4) is also fulfilled. On the weak reading of this condition, it would require that the new welfare economics fails to solve an unresolved

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[37]A methodological dispute is likely to take place in connection with this and related examples. Some writers in normative economics (e.g., Fleurbaey, 1996) 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 these can be achieved in the economy. It seems that normative economics must be concerned with implementation issues, if only because they make part of the considerations weighing for or against evaluative criteria.

problem of either social choice theory or public economics, *or* fails to solve some problems that these theories do resolve, *or* fails to raise and eventually solve a problem of its own that these theories are silent about. On the strong reading, the three failures would be required at a time. In general, the weak reading is preferable; or else, the tentative criterion of progress would very rarely apply. However, in the present instance, the failure is multiple, and there is no need to decide between the weak and strong reading. The new welfare economics never rebound after the social choice theorists' critique. Some works with this title were still published beyond the sixties. The strongest ones contain an admixture of social choice theory with public economics; the others amount to little more than a repetition of the work done in the forties.[38]

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.

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[38] Feldman's (1980) and Boadway and Bruce's (1984) classic texts enter the former category. De Graaff (1957), Mishan (1969), and the later editions of Little (1950) sadly illustrate the latter category.

(IV) Normative economics is not concerned with social states in general. Only economic variables will enter its description of the states.[39] In effect, the economic variables to be taken into account are the quantities of commodities 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. Monotonicity or at least non-satiation is typically imposed, and convexity is sometimes also. Other assumptions will have to be introduced to deal with risk and uncertainty, and this is done 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.[40] 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).[41]

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 restrictive notion of social states in welfare economics. This means that we should

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[39]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; more about it in Mongin (2001).

[40]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.

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

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 several times.[42] What I want to stress in connection with the present inquiry is 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.[43] 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., 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* preferences in a sense which is not

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[42]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).

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

that of "values" in the Arrovian sense, but rather preference for the individual's own good.[44]

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. This definition trades on an unspecified notion of "utility", which makes it useful to describe the economists' work, since they are often mute about their chosen interpretation of "utility". However, in the present context where I try to disentangle their positions, it is more appropriate to define welfarism as the claim that individual *welfare* data are both necessary and sufficient to form an index of social welfare. Then, welfarism 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.[45] 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 further sense of "welfarism" would be appropriate for those theorists who are willing to accept (I) fully, but only a qualified version of (II).[46] 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.

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,

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[44]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.

[45]About the pitfalls of the Pareto Principle, see, e.g., Mongin (1997).

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

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 earlier 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 can sometimes be appreciated only by comparing non-successive theories. I have sketched the relation between three theories T, T' and T", and claimed in effect that T was not superseded unless T" came, despite the fact that T' had already provided good reasons for giving up T. A problem-based conception of progress leads one to consider *sequences of theories rather than just pairs*. This happens because problems have a life of their own, some of them being quickly clarified, while the others drag on for years.

9. Conclusions and further elaborations

By way of conclusion, I return to the definition of progress given at the beginning of the paper, and discuss possible qualifications or refinements of the requirements. Consider (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 requisite (1) with an external decision procedure, which may be redescribed as follows.

Having shown in my historical survey that the controversy between T and T' hinged on the ways of understanding the ill-defined formal construal "Bergson-Samuelson social welfare function", I was involved in the semantic exercise of comparing Arrow's interpretation of this construal with the welfare economists' official and actual

interpretations. The exercise was primarily, but not exclusively semantic. To use the familiar distinctions, it also involved a pragmatic and even a rhetoric component. A crucial point about the controversy was that the welfare economists *changed* their - admittedly loose and mostly implicit - initial understanding of the "Bergson-Samuelson social welfare function" in order to reply to Arrow's critique. They provided a - this time, fully articulated - reconstruction of the formal construal in question, expanding on this occasion about "the tradition of the field" at large. I showed that this was a strategic move, and actually not a successful one, which involved me in going well beyond semantics as it is ordinarily defined. It is relevant to stress this meta-methodological point, in order better to highlight the differences between the standard frameworks of progress in philosophy of science and the problem-based approach that was tried in this paper. An alternative, more traditional account of the external decision procedure would go roughly as this. Investigate the formal language of theory T and the intended interpretations of the statements made by T using this language. If the problem mentioned by T' could have been formulated in the language of T, and if once so formulated, the problem would have fallen within the range of the intended interpretations allowed by T, then you may conclude that it was a theoretical problem *for* T. This description does not fit my narrative, which involved me into entering the economists' "conversations", as the fashionable expression goes. I hasten to add that the approach suggested here is by no means *initially* pragmatic or rhetoric. Rather, it resorts to the analysis of communication failures (e.g., Samuelson's 1977 reply) and argumentative moves (e.g., Arrow's unfinished attack against Bergson, or the welfare economists' parade) only when semantics is not up to its *own* task and, accordingly, needs to be complemented from the outside. It is semantics, not pragmatics or rhetoric, which comes in first instance and orients the subsequent investigation.[47]

Consider now requirement (2). It was 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 less apparent feature of (2). The requirement that T' should continue to solve the main problems that T had solved is strong 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

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[47]This all too brief account may be compared with the method of studying scientific controversies recently put forward by Dascal (1998), and already illustrated in the field of economics by Dascal and Cremaschi (1999). There are both analogies and disanalogies. Neither Dascal's nor my method have much in common with McCloskey's (1994) beyond the general point that argumentative strategies should matter to the study of economics.

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 in this paper 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 an 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]

Requirement (4) was said to be easily met, a feature which makes the present study unrepresentative. Economics contains more complicated cases in which the first three conditions would apply more or less unproblematically, while the fourth one would not be met so easily. The theory of choice under risk may be one such case. The so-called non-expected utility constructions solve a number of problems - some of them empirical, but others normative - that were gaping open in von Neumann-Morgenstern theory. However, the smooth analysis of risk-attitudes provided by the latter has not found a complete analogue in the former. There are simple questions relative to insurance coverage or portfolio diversification that they cannot answer well. If one were to reconsider this example along the lines suggested here, one would have to make a choice between the strong and weak notions of progress corresponding to the conjunctive and disjunctive interpretations of (4), respectively.[50]

Here is now a warning I would like to make, lest the exercise of this paper be misunderstood. Welfare economics died, or rather disintegrated progressively, for many different reasons, *not all of which are connected with the emergence of a progressive*

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

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

[50]The putative example of progress constituted by nonexpected utility theories was discussed by Mongin (1988) along Lakatosian lines; it has been usefully reexamined by Guala (2000).

alternative theory. The pre-war controversy on market socialism could not be resolved by means of the fundamental theorems, nor more generally in terms of existing welfare economics; this was perhaps the first serious warning about its limitations. The post-war years witnessed an increasing discontent with its policy conclusions, not only because of the pervasiveness of externalities, but also because of "second-best" considerations, as introduced by Lipsey and Lancaster (1956). These and other economists of the time who contributed to the foundation of public economics cast doubt on the general relevance of the marginal conclusions for the optimum. So the lasting achievements of the new welfare economics proved dubious after all, even to those who were *not* impressed by Arrow and his new style of theorizing. This suggests that one should be clear about the following distinction. There is a difference between claiming that conditions (1), (2), (3) and (4) 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 purport to make causality claims. But it suggests links that could possibly be turned into causality claims; it is left for the historian of economics to decide that.

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