Is There Progress in Economics?
Knowledge, Truth and the History of Economic Thought

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10. Is there progress in normative economics?

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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 judgements 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) and 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 non-committal 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 non-committal statement because it does not say whether normative economics itself endorses the evaluations (and thus makes value judgements) or just explores the way of making them (and thus only relates to value judgements). 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 some economists might disagree with it.
A second difficulty is that philosophers do not provide obvious guidance on 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 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.

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.\(^4\)

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 premises – 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, that is, 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 1970s 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 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 developed in a quasi-autonomous way from the 1970s and 1980s. 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-1980s, 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 analysing 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 reshaping 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. And it is a fact that public economists have hardly begun to catch up with the new developments. This said, nobody would deny that welfarism 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 – that is, 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 welfare economics. I do not think we are yet in a position to say anything definitive. In its more theoretical parts, and that welfarism is one of the major issues currently under discussion.

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, especially 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. 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 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 by anomalies. 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) 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

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.

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: 312) – that depends on all the individuals' consumptions of commodities and supplies of factors. Bergson just makes broad qualitative restrictions, that is, that E is increasing in consumption and decreasing in factor (that is, 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, that is, 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 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

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 1, Arrow chose in Chapter 3 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 6. 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 func-
tion ... that will satisfy Conditions 2-5 and that will lead to a true social ordering
for every set of individual tastes. (Arrow, 1963: 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 straightforward 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 had really adhered to it, the work he did in the 1950s on
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 compli-
cated 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.

THE SOCIAL CHOICE – THEORETIC CRITIQUE OF
WELFARE ECONOMIES: 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, analyse social states in
terms of individual consumptions and supplies of factors, and their notion of

The ground is now cleared for the third and only really problematic step,
that is, to defend each of the conditions – modified universal domain, inde-
pendence of irrelevant alternatives, Pareto or related conditions, non-dictator-
ship and social ordering – in terms of the general objective and privileged
interpretations of welfare economics. Arrow (1963: 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 was irrelevant to their field. ‘We must conclude that Arrow’s work
has no relevance to the traditional theory of welfare economics, which culmi-
with Little in barring Arrow’s theorem from welfare economics’, added
Bergson (1954: 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 tech-
nological parameters, such as the firms’ production functions. There is no
sense in trying to extend 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

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 among 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 nearer 1963 version.\textsuperscript{23} 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 1970s established that both independence and universal domain could be replaced by conditions stated for a single profile, leading to reproduction of the negative conclusion of Arrow’s theorem in this less controversial framework.\textsuperscript{23} I will denote these ‘single profile’ analogues of the initial conditions by universal domain\textsuperscript{*} and independence\textsuperscript{*}. Universal domain\textsuperscript{*} is satisfied by welfare economics, given the standard assumptions of this theory. Independence\textsuperscript{*} 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.\textsuperscript{24}

The second major point made by the welfare economists, notably Little (1952) and Bergson (1954), is that their economic welfare function should not 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 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, that is, 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 from 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: 243) did not exist. But it has been argued repeatedly and, I think, convincingly that methodological individualism is not the thesis that collective actions do not exist. It is rather the (weaker) thesis that they cannot be 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’ premise 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, namely, 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?\textsuperscript{25} 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 – that is, the Pareto principle, and arguably non-dictatorship\textsuperscript{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 sense in saying that they belong to theoretical welfare economics.\textsuperscript{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: 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 exercise 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 argu-
ment. 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) 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 formula-
tions.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
contribution 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 directly 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), namely
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 state
precisely what the specific problem was. I submit that the following version of
the impossibility theorem is appropriate: ‘a Bergson–Samuelson welfare func-
tion 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 social choice theory resolve 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 compen-
sation principle.

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 2, but Scitovsky’s more sophisticated ‘double test’
pretended to remedy this defect. Arrow argues that the Scitovsky test is also
inconsistent. 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 conclu-
sive 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 demon-
strates (Arrow, 1963: 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 prin-
ciple; 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 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. This connection means good news for my thesis that the latter is progressive with respect to the new welfare economics. In the 1940s, the cyclicity of the compensation tests was construed somewhat as 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'.

SOCIAL CHOICE THEORY AND THE CONDITIONS OF PROGRESS

Thus far, I have mostly been 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, that is, weakening the unrestricted 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. The welfare-oriented social choice theorists have usually explored the second road, and meanwhile formalized particular ethical criteria, some of which are completely standard (for example, utilitarianism), others not so (for example, Nash's product of utilities).

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. 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.

How does this sketch compare with what we know of the new welfare economists' attitude towards normative commitments? They were wary of certain 'value judgements' and willing to indulge in others. They took the Pareto principle to be both normatively commendable and indispensable, and they regarded judgements 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 theoretical 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 1970s 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 fulfillment 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 substantively. 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 – that is, the non-manipulability of social choice decisions.59

THE ASSUMPTIONS OF WELFARE ECONOMICS AND THE FOURTH STAGE OF NORMATIVE ECONOMICS

Although the main point has already been argued, that is, that the third stage was a progressive one, I would like to take a broader view of my topic and briefly re-examine the basic assumptions of welfare economics. As will become apparent, the point is to relate them to the current work, that is, 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 heatedly criticized, with the passing of time. The following list is an attempt to capture them in terms of the ideal concept of normative economies that becomes better and better understood, and actually more and more heatedly progressive.

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 explained 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 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.
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. There may be all sorts of reasons why I choose x instead of y, not all of them 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 judgement surfacing in their choices.

One way or another, the critique just sketched has been made a number of times. 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. It is really only in the work currently pursued about non-standard 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 (for example, 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 that is not ‘values’ in the Arrovian sense, but rather preference for the individual’s own good.

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) Pareitian Liberal paradox. The case against necessity is not so straightforward to argue, and might involve one considering the pitfalls of the Pareto principle in the uncertainty context, which would involve assumption (VII) in the discussion.

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). The case against necessity is then expedited by taking note of highly desirable objective achievements such as good health, education, real freedom and so on. 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), that is, 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 (for example, 1981) work – a literature which is permeated with deontological considerations.

This bird’s-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, that is, a critique which would hit not only the Bergsonian economic welfare function, but the Pareitian 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 1950s to 1970s 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 the time has now come to reconsider the definition of progress tentatively offered at the beginning of this paper.

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, that is, 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 \( T \), that is, its theoretical language and intended interpretations. If the problem could have been formulated in the theoretical language, and if once formulated, it would have 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 again dragged the time-honoured rule of utilitarianism into welfare discussions is an example to the point. 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.

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 unconnected with the emergence of a progressive alternative theory. The post-war years seem 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.

NOTES

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1. There is nonetheless a continental tradition of considering ethics as a normative science; see Kahunowski (1969) who traces it back to the Leipzig philosopher Wundt at the end of the nineteenth century. However, this tradition has had little influence even in France and Germany.
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: 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 (1948) history of early welfare theories. But again, The Economics of Welfare calls for a detailed reappraisal.
5. Beginners sometimes believe that the two theorems taken together form an equivalence statement. This is not the case.


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 so crucial as the following question: does the given theory implicitly obey Arrow's independence condition, or does it not?

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.

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 theorems can be accompanied by anomalies, as Lakatos’s (1963–64) classic polyhedral example shows.

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

12. Called the ‘Fundamental Value Proposition of Individual Preference’ by Bergson (1938: 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.


15. There are further methodological differences between the two papers. Bergson is concerned with classifying the welfare conclusions in terms of various ‘value judgements’, while Laumann’s choice is to distinguish them in terms of their ‘operational significance’.

16. Universal domain, positive association, independence of irrelevant alternatives, non-impersonation, 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 form of five conditions later used as the social 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 of maximal alternatives will usually be useful in studying those aspects of social choice which are directly related to consumer’s (and worker’s) choice’ (Arrow, 1963: 37). The same idea is put forward in (1963: 63–4) where, however, it is significantly qualified.


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’ (Arrow, 1963: 37).

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 Arrowian 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:

\[ E = E \left( x_1, \ldots, x_m, y_1, \ldots, y_j, \ldots, y_r, z_1', \ldots, z_n', \ldots, z_k', \ldots, z_l \right) \]

where \( x_j, \ldots, x_m \) are the amounts of the \( m \) commodities consumed by individual \( j \), and \( y_j, \ldots, y_r \) are the amounts of labour expended by \( j \) in each of the \( m \) departments of production. Now applying the Pareto principle (‘Individualism’ in Bergson’s terminology), we conclude that \( E \) can be written as:

\[ W \left( U_1(x_1', \ldots, x_m'), \ldots, U_j(x_j', \ldots, x_m'), \ldots, U_r(y_1', \ldots, y_r'), \ldots, U_r(y_1', \ldots, y_r), \ldots, U_l(z_1', \ldots, z_k'), \ldots, U_l(z_1', \ldots, z_k') \right) \]

The welfare economists’ point is that only the variables of the \( U_j \), not the \( U_r \) 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 positive association, Little (1952: 141) shot 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 multo- 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).

25. As Alain Trannoy pointed out to me, the ‘client’ scenario seems to be compatible with accepting the possibility of dictatorship. Bergson (1954: 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.


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.

29. Clear evidence for this can be found in Bergson himself (1938: 323).

30. Arrow (1983: 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.

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

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 Arrowian 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.

35. See Le Breton and Weymark’s (1996) survey of ‘economic domains’.


37. For a good example of this methodological stance, see Fleurbaey (1996: Ch. 1).
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