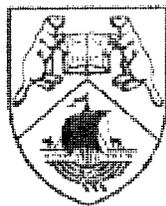Social-Welfare Functions: Some Dissonant Notes

by
A.L. Levine

Working Paper Series 99-03

DEPARTMENT OF ECONOMICS
THE UNIVERSITY OF NEW BRUNSWICK
FREDERICTON, CANADA

SOCIAL-WELFARE FUNCTIONS: SOME DISSONANT NOTES

Larry Levine

I. Introduction

This paper is essentially a reconnaissance. It offers no "hard" solutions. Instead, it presents various "loose ends" and unsolved problems.

Section 2 surveys the essentials of the Bergson-Samuelson social-welfare function. Section 3 offers notes on economic-policy issues, and a further elaboration of implications of the Bergson-Samuelson social-welfare function. Section 4 outlines a "modest proposal" concerning interpersonal comparisons of utility or welfare. Section 5 is a concluding note.

Dissonant notes are sounded throughout all or most sections.

2. The Bergson-Samuelson Social-welfare Function

The Bergson-Samuelson social-welfare function owes its origin to Bergson's "Reformulation of Certain Aspects of Welfare Economics" (Bergson, 1938 and 1969) and to Chapter VIII of Samuelson's Foundations (Samuelson, 1947 and 1985).

For the derivation of the Bergson-Samuelson social-welfare function, one takes as a starting point the utility functions of the members of the collectivity. The individual utility functions are ordinal and have as their arguments, whatever it may be that provides individuals with utility or satisfaction.

Denominating the arguments of the individual utility functions as z's, the Bergson-Samuelson social-welfare function may, in Samuelson's notation, take the form, $W = W(z_1$

z_2, ...), the z's representing "all possible variables, many of them non-economic in character." Moreover, the W function "need only be ordinally defined, and it may or may not be convenient to work with (any) cardinal index or indicator." (Samuelson, 1983, p. 221) Presumably ordinal "definition" of the W function also applies to the individual utility functions of which the W function is ultimately compounded.

As to constraints, among the z's there will be a number of technological relations or constraints. Just what should be included among the constraints or "givens" will depend on the level of abstraction adopted. And, there can be an entry of value judgements. To bring these into the picture, Samuelson's external ethical observer (presumably a proxy for social consensus) appears on the scene. The ethical observer is not only a "specifier of value judgements," as Samuelson describes this device, but is also a specifier of the level of abstraction to which recourse can be had (Samuelson 1983, p. 221).

Continuing with the matter of the constraints on the W function and the appropriate level of abstraction, Samuelson observes, somewhat whimsically, that the specifier of value judgements "may wish to take all social and economic institutions as fixed and unmutable except those relating to the Central Bank. (Indeed, those of a fatalistic temperament may regard the constraints as so numerous as to leave no problem of choice.)" (Samuelson, 1983, p.221)

Thus, keeping in mind the constraints on the objective function, the relevant maximization may be written as max W, s.t. (again, in Samuelson's notation)

$$g^j (z_1, z_2, ...) = 0$$

Of course, a complete account of the constraints or conditions for max W should

include fulfilment of the usual marginal conditions for maximization: namely, the marginal rate of substitution between any two goods in consumption must be equal to the marginal rate of transformation between these same two goods in production. (Obviously, this is a necessary condition.)

Not surprisingly, there is also an intrusion of that condition which Samuelson describes as stemming from the "individualist philosophy of Western Civilization"; namely, the condition that, as Samuelson put it, "individuals' preferences are to count." (Samuelson, 1983, p.223) This being so, then Samuelson's ethical observer or specifier of value judgements must not tell individuals precisely how to maximize their utilities or exactly which mix of z's to choose.

Here is a "real-world" gloss on Samuelson's condition concerning the primacy of individuals' preferences. It comes from a story filed by a New York Times reporter who was covering a Chicago mayoral election some years back. The reporter quotes one Wayne Derengowski, Democratic precinct captain for the Second Precinct of the 33rd Ward of the City of Chicago as follows: "If we didn't work our precincts," Mr. Derengowski is quoted as saying, "then the people would vote the way they actually feel." (Incidentally, the reporter describes Mr. Derengowski as being not only a precinct captain, but also a "dispenser of garbage cans, arranger of block parties, adviser on real estate tax protests, and adjuster of parking tickets.")

An intriguing question: does the list of "givens" include the existing pattern of income distribution? In so far as Bergson (1938) is concerned, the answer appears to be

"yes". And Samuelson? What is one to make of this passage? If the specifier of value judgements "is an out and out utopian he may wish to <u>ignore</u> various institutional relations regardless of their empirical importance." (Samuelson, 1983, p.221, emphasis added)

Reminding ourselves that individual utility functions constitute the bottom line in so far as the social-welfare or W function is concerned, the social-welfare function may be rewritten (in Samuelson's notation) as the following additive function:

$W = F(U^1, U^2, U^3, ...)$, where the numerical superscripts denote the members of the collectivity (Samuelson, 1983, p.224).

One the other feature (or assumption) – although it has already been revealed by the additivity character of the Bergson-Samuelson social-welfare function – should be singled out for the sake of emphasis, even at the risk of repetitiveness, so crucial it is for present purposes. The arguments of the W functions have as their referents individual utility functions, it being assumed that these individual functions are independent, not interdependent. In other words, there are no inter-individual externalities in so far as the individual utility functions are concerned.

Let us be absolutely clear about this. In order <u>to</u> be clear, it may be useful to distinguish between (1), Veblen-like inter-individual emulation in consumer behaviour (or externalities or interdependence in a rather shallow sense), and (2), what we may refer to here as interdependence in a deeper sense; that is, where the (perceived) welfare or utility of others can feature as arguments in individual utility functions. (See Becker's "Theory of Social Interactions" [Becker, 1974], where interdependence in both senses may be said to

appear in Becker's model of benevolence.) Note, though, that what we referred to as interdependence in a deeper sense is not to be equated with a near universal benevolence. For interdependence of the deeper sort, it is enough if benevolence affects only some people. (We shall not introduce the possibility of malevolence in our treatment of interdependence.)

Samuelson's rejection of interdependence is directed – and this quite explicitly – against any assumption of interdependence in the shallow or narrow, Veblenesque emulation sense. That said, it is surely not straining text for interpretation to say that Samuelson's ban on interdependence must be taken to be a ban on interdependence, period, including that interdependence of utility functions in our deeper sense. Of course, an assumed independence in the manner of Samuelson might seem to destroy the very rationale for the existence of such a thing as a social welfare function; that is, given the validity of our reading of Samuelson's "independence" assumption.

Consider, now, a different, but not totally unrelated, problem: that of the tenuousness of the link between "individual" and "social." This issue has a point of contact with the problem that philosopher Jon Elster encountered when he (Elster) attempted to develop some explanation for the existence of social norms (Elster, 1989). To Elster, self interest, however defined, provides a partial explanation of adherence to, and the existence of, social norms. But, beyond this, Elster did not appear inclined to go. "There must be some further explanation, x, of why norms exist. I have (considered) various candidates for x and found them wanting. I have no positive account of my own to offer. In particular, I have no suggestions as to how norms emerge and disappear." (Elster, 1989, p.115)

The problem of the tenuousness of the link between "individual" and "social" and the concomitant failure (as Elster reported it) to explain the existence of a "social norm" stemmed, it could be argued, from insisting that the connecting link had to be from a private interest or self-interest (or individual utility) function to an aggregate social interest or social welfare function. As we see it, and keeping in mind the need for some rationale for the exercise of concern – i.e., the Bergson-Samuelson exercise, not the Elster exercise – the need is surely for some notion of an individual social-interest function. The Bergson-Samuelson exercise in effect envisages the transformation of conventional (i.e., non-interdependent) individual utility functions into a social-welfare function. This is surely a glaring gap in the exercise: we are presented with a mapping or aggregation unaccompanied by an explanation of "how" or "why." How or why can there be said to exist a social-welfare function that derives from the aggregation of private utilities (or self-interest functions), or an index that maps from individual to social welfare? The Bergson-Samuelson social-welfare function really does more than merely aggregate individual utilities (or utility functions). It mysteriously transforms individual welfare into social welfare. However, such a transformation exercise should not be envisaged without at the same time assuming the existence of individual social-interest functions (cp. Harsanyi, 1955). But such a notion seems to be alien to the Bergson-Samuelson context.

To get at what is really the heart of the matter: it is fair game to inquire, why would a group of individual utility maximizers even care about a rather nebulous something called "social welfare"? Surely the very notion of a Bergson-Samuelson social-welfare function must carry with it the implication that people actually do "care" about "social welfare". But,

again, given the Bergson-Samuelson context, as it relates to the individual, why should these individuals care? After all, the individual utility functions in the Bergson-Samuelson scheme are not of the interdependent variety (in our sense of "deep" interdependence): j's welfare does not appear as an argument in i's utility function (cp. Amartya Sen's London School of Economics and Political Science inaugural lecture, "Behaviour and the Concept of Preference," Sen, 1973).

It appears, then, that the Bergson-Samuelson social-welfare function does more than "aggregate" individual welfare functions. It "transforms" individual welfare into social welfare without offering satisfactory explanations of – or, better still, justifications for – such "transformations," and without providing a context for postulating the needed individual social-interest functions. (Note the point of contact here with John Harsanyi's distinction between the social-welfare function of the individual and the utility function of the individual [Harsanyi, 1955], a matter to which we shall return below.) In other words, the Bergson-Samuelson social-welfare function presents a transformation without bringing into full view key assumptions necessary for validating the exercise. But, surely, the individuals who are the starting points for the derivation of a genuinely social welfare function must be people who are endowed with individual social-interest functions (in the manner of Harsanyi).

3.   Economic Policy Issues, and a Further Discussion of Implications of the Bergson-Samuelson
Social-Welfare Function.

One cannot push very deeply into the notion of a social-welfare function without
having some encounters with economic-policy issues. These encounters can pose problems.
Listen to Amartya Sen on this (Sen, 1973):

"Ideas of social-welfare figure by implication in much of economic policy
debate. Even though, say, the size of the budget may not be decided directly
with reference to any explicitly defined notion of social welfare, but in line
with the contingencies of practical policy, a demand for deeper justification
of these pragmatic policies has to be met by something more than references
to governmental advantage, unrelated to the gains and losses of members of
the society. That demand is inescapable in policy analysis, even if it is not
explicitly stated on each occasion. Practical interest in welfare economics
has always rested on its role in putting debates on economic policy on a
deeper foundation."

Whether or not there is in the profession actually a demand for "deeper justification"
of pragmatic policies, there is surely some interest in the "gains and losses" of members of
the society. But identifying the winners and losers is not always easy. And "evaluating"
gains and losses is even more difficult.

Now, recall that the Bergson-Samuelson edifice – i.e., the social-welfare function
itself, as well as the underlying individual utilities or utility functions – appears to be

predicated upon an ordinalist view of utility. (Or, more precisely, the W function "need only be ordinally defined.") However, any notional evaluations of "gains and losses" can only be undertaken in a meaningful way by viewing utility (or welfare) as an in-principle cardinally measurable phenomenon and, twinned with cardinalization, by adopting Arrow's view that "some form of interpersonal comparability is needed to secure positive results" in these matters (Arrow, 1984, p.173, emphasis added). Notice, then, that what we have here appears to be an abandonment by Arrow of the implicit ban on interpersonal comparability of preference intensities in condition no. 3 of his "impossibility" theorem (?)

There was a time in that distant pre-Pareto past when it was believed that there could be aggregation over additive cardinal utilities or additive utility functions, and by this sort of sleight-of-hand one could wind up, thanks to Edgeworth, with a neat sum-of-utilities criterion to be applied to the choice of policy alternatives. Of course, Pareto destroyed all that, and the race was on to the social-welfare function of the so-called "New Welfare Economics" of the later 1930's and beyond. Bergson (1938), giving post-Pareto ordinalism a new kind of foundation, got there first. Paternity for the post-Bergson re-birth of post-Pareto ordinalism in a risk-free world, was mixed. It goes back to the 1950's; principally to the landmark papers of Marcus Fleming (1952) and John Harsanyi (1955). We omit the von Neumann-Morgenstern variant, for the world of risk, including Vickrey's (Vickrey, 1945) application of von Neumann-Morgenstern to a variant of the Bergson-Samuelson social-welfare function. Re-birth (in part), yes; but a return to the pre-Pareto doctrine of an additive cardinal-utility function as "intuitively self-evident" (Harsanyi, 1955), no.

In the pre-Pareto days, cardinality and additivity made life easy for the welfare theorist. That is, the distinction between something called social welfare, on one hand, and phenomena known as individual utilities, on the other, seemed in logic to be crystal-clear. On the level of concept, one presumably introspected and then summed over the fruits of such introspection in order to derive "social welfare".

But with the revamped versions of cardinality and additivity of the not-so-distant past, life ceased to be so simple; for the sharp social-welfare/individual utilities distinction of the distant past has, in the last four decades or so, tended to become blurred. For instance, this is quite apparent in the work of Harsanyi. In place of the pre-Pareto distinction (i.e., "social" versus individual utility), Harsanyi recognized a distinction, which is also subject to blur, on the level of the individual; namely, a distinction between the social-welfare function of the individual and the utility function of the individual. The social-welfare function of the individual is supposed to represent the individual's "values" and hence may be taken as an expression of the individual's "ethical preferences," whereas the utility function of the individual expresses the individual's "tastes." The "ethical preferences" are supposed to be "impersonal" or "objective;" that is, these preferences represent an expression of what the individual prefers "on the basis of impersonal considerations alone," as Harsanyi put it (Harsanyi, 1955)

The individual's utility function, on the other hand – or the function which is supposed to represent the individual's tastes – is "subjective;" there is nothing impersonal or "objective" about it. And, it is not derived from "impartial" social considerations.

However, this dichotomy is somewhat artificial. Harsanyi implicitly concedes as

much when be observes that the individual utility function, or concept, has come in logic, if not in fact, to be much closer to the individual social-welfare function as a result of individual recognition of externalities – a recognition which springs from a concern by the individual with such "values" as justice and the like – in a variety of human activities.

So, the notions "subjective" and "objective" appear, in this context, to lose some of their definitional sharpness, as individual utility functions become enriched in the manner just indicated – enriched, that is, with interindividual interests and "moral contingencies."

Now, for many – for example, for Arrow (1977) – much of the "beef" in Harsanyi's "hamburger" is to be found in Harsanyi's absorption, into his (Harsanyi's) exercise, of individual choice over uncertain prospects; in effect, absorption of the lore of von Neumann-Morgenstern (via Vickrey and Fleming. We shall not be concerned with this admittedly important aspect of Harsanyi's contribution.)

At this juncture, let us push somewhat more deeply into cardinalism per se – looking at both advocacy and defining characteristics (not that the two are mutually exclusive.)

As to advocacy, let Marcus Fleming have the floor for a moment:

"I should not have thought it worth-while to engage in a cardinalization of

welfare as a pure exercise in moral philosophy if it had not seemed to me to

serve a useful purpose [in] welfare economics...[certain] of the rules of

prescriptive economics can be more clearly and helpfully formulated if it is

permissible to refer to welfare as measurable." (Fleming, 1952)

It was found by some to be not very useful, as Deaton and Meullbauer (1980, Chap.9) have

reminded us, to speak of social-welfare functions (say, in the manner of Bergson-Samuelson) aggregated or defined over <u>ordinal</u> utilities; not very useful, that is, if the objective is the provision of "clear" rules for prescriptive economics, for determining the welfare effects of "situational changes."

As to defining characteristics, Fleming's advocacy here takes on some cogency if one classifies situational changes, as Fleming (1952) did, into (1), those where a "productional" component predominates, and (2), those where a "distributional" component is dominant. As regards the productional component of a situational change, everyone shifts in the same direction – either more favourable or less favourable. Where the distributional component predominates, the position of some is improved and that of others is worsened.

To Fleming (1952), the most "obvious" application of the cardinal utility notion is, not surprisingly, to distributional (in his sense) matters. Here, in order to evaluate, in a cardinal manner, the effects on individual welfare of situational change, recourse will obviously have to be had some kind of "objective" yardstick for measurement of the difference in individual well-being engendered by situational change. If one could ascertain the type of household, with respect to "objectively" measurable characteristics, to which individuals belong, then an index-number measure of change in individual utility could, given the pertinent household characteristics, be derived from expenditure and price data (cp. Deaton and Muellbauer, 1980, Chap. 8). This will have obvious relevance to the notion of "extended consensus," to be discussed below. Actually, there already has been some of this in the journal literature, especially in the <u>Economic Journal</u> back in the 'eighties. That is, households endowed with the same characteristics could be considered as belonging to

the same set with respect to the welfare effects of price and expenditure change. While such a procedure may be said to be drowned in arbitrariness and subjectivity, it is surely no more so than other comparable procedures in the social sciences.

When we turn to changes characterized by productional considerations, in Fleming's sense, there would appear to be some "easy" solutions, at least on the level of concept. The changes in consumers' and producers' surpluses, of the Marshallian tradition, generated, say, by the imposition of a new tax or the construction of a new public project, and represented by the relevant areas under product-demand and factor-supply curves, might well be the least unsatisfactory way of attempting to perceive welfare effects cardinally (Fleming, 1952) – assuming, of course, negligible income effects.

4.   Interpersonal Comparisons of Utility or Welfare: A Modest Proposal[1]

Let Deaton and Muellbauer fire the first salvo: "The substantive issue here is ...not whether interpersonal comparisons should be made, but how." (Deaton and Muellbauer, 1980, p.217, emphasis added)

In reality – i.e., in "actual practice" – that problem which is the existence of the social-welfare function is "solved" by the collectivity, be it a nation state, a province, a municipality or whatever, in that exercise which is social choice-making cum politicking or compromising among a diversity of sometimes not easily reconcilable group views and objectives. It is an exercise characterized by attempts to perceive individual gains and losses, where the "individuals"could typically be large groups of people.

Cardinal interpersonal comparability here is within the realm of the possible. And,

the strongest form of cardinal interpersonal comparability is ratio-scale comparability which, following conventional usage, we may refer to as full comparability.

In order to describe ratio-scale or full comparability, the basic transformation could be set out in this way:

$U^l = a_i + b$ (U_i), where the numerical superscript refers to some consumption activity, 1, and the subscript i refers of an individual i. The matter of whether i's total utility function should be taken to be Marshallian (i.e., intra-individually additive) or Edgeworthian (intra-individually non-additive) is not relevant here.

Also, for ratio-scale or full comparability, $a_i = a_j = 0$ for all individuals i, j in the society. Note that it might be contended that if a_i is merely $= a_j$, instead of $a_i = a_j = 0$, it could, as a consequence, be virtually impossible to conceptualize a common intercept, a, for all individuals.

What will confer commonality here is the notion of absolute zero or nothingness, or simply zero in the mathematical sense. (My "silent" collaborator, Li [1985], went into this in some depth. I shall not.) Von Neumann defines zero as the set that contains only the empty set (cf. Kuratowski and Mostowski, 1968, p.270). Furthermore, the empty set is irreducible. In short, zero on this view may be said to denote the non-existence of everything. Li (1985) has suggested that the circumstance which is painless suicide best captures the notion of nothingness that is pertinent here (i.e., the zero notion of mathematics).

On the other hand, where there is cardinal unit comparability (and retaining the same

basic transformation), a_i will in effect be independent of a_j for all $j \neq i$. In short, there will not be a unique origin or "natural zero" for all utility functions; or, more felicitously, individual i will be assumed to be "independent," in some sense, of individual j. On the other hand, b will be the same for all i, j; it being assumed that the basic transformation will be one that will permit the scaling term $b_i =$ unity (or, as the mathematicians would say, that the basic transformation will be an affine one. (An affine transformation is the sum of a constant and a linear mapping.) In other words, b is a unit of measurement common to all individuals. Thus, with cardinal unit comparability, and unlike cardinal ratio-scale comparability, there can be no interpersonal comparisons of utility levels, only of utility differences. But for some, the problem with cardinal unit comparability is that because a_i is independent of a_j for all i, j, the utility function cannot be of the "richer" variety; i.e., one that includes various interpersonal concerns among its arguments.

Skeptics may ask, how can one conceptualize interpersonal comparability. One response to such a query could be provided if we postulate the existence of series of "comparability sets" and proceed along lines suggested by Deaton and Muellbauer (1980, Chap.8) and others. Specifically, imagine a conceptual division of the community into types of households.

The notion of a "comparability set" has been developed in some detail by Li (1985) under the label, "extended consensus." A quite prosaic example (also from Li, 1985) will capture the essence of the concept, extended consensus. Imagine two amateur baseball players, S and T, who are of the same age and of very similar socio-economic backgrounds,

so that for these two individuals one may postulate identical cardinal utility ("intensity of preference") in so far as baseball in concerned. Then, if we move from baseball to other consumption activities – e.g., listening to classical music, eating seafood, etc., etc. – we will probably find marked differences with respect to intensity of preference for these other activities, with intensity of preference for baseball serving as a common basis of comparison with these other activities.

Next, imagine an entire set of amateur baseball players, Q, a set of listeners to classical music, R, and so on. Many of these sets will not be disjoint: they will have intersections. Interpersonal comparisons of utility will therefore be conceptually possible if one makes use of the intensities of preference that members of the various sets have in common. Furthermore, such interpersonal comparisons will be feasible, even if the intersection is a singleton.

Bases for interpersonal comparison of intensities of preference will therefore be provided by numerous comparability sets; in short, by what Li has called "extended consensus."

Continuing with this point of view, two comparability sets with a non-null intersection may be said to be chained. And, for n comparability sets, A, B, C, ...N, if A is chained to B and B to C,..., M to N and finally A to N, the sets A to N may be said to form a loop. An entire society will be characterized by extended consensus if all of its comparability sets are chained.

Note, of course, that with a common zero point or origin for all individuals' utility functions, we are literally half way to that extended consensus or closed loop which provides

justification, on the level of concept, for interpersonal comparison of utility. After all, only one other common point (i.e., intersection) is required for interpersonal comparison with respect to the utility to be derived from a particular activity, state, or change in state. (Again, consult Deaton-Muellbauer, 1980.)

If at this juncture one wishes to enter a caveat about all this, one should remind one's self that a caveat has already (actually, over two decades ago) been entered by Kenneth Arrow. In a paper on "Extended Sympathy and the Possibility of Social Choice" (Arrow, 1977), Arrow argued (if I may, with some license, describe his argument by paraphrasing) that there is within every individual some element (some bottom line or "island within", to borrow, admittedly somewhat inappropriately, the title of a novel by German-American novelist Ludwig Lewisohn) that is denied by any such postulated procedure. (especially those procedures making use of the notion of a comparability set for interpersonal comparisons of utility. "... reducing an individual to a specified list of qualities is denying his individuality in some deep sense. In a way that I cannot articulate well and am none too sure about defending, the autonomy of individuals, an element of mutual incommensurability among people seems denied by the possibility of interpersonal comparisons. No doubt it is some such feeling as this that has made me so reluctant to shift from pure ordinalism, despite my desire to seek a basis for a theory of justice." (Arrow, 1977, p.255. Incidentally, note that as regards the concept, extended consensus, there is a point of contact with Adam Smith's notion of "sympathy" in his <u>Theory of Moral Sentiments</u>. See A. Smith, 1966.)

For Arrow's problem of "mutual incommensurability among people," Deaton and Muellbauer (1980, p.225) have a rejoinder which runs as follows. In making the interpersonal comparisons at issue here, the concern is not really with individual welfare levels per se, but, rather, with the "objective circumstances" and in particular with the constraints faced by individuals. Accordingly, if everyone had the same preferences, the welfare level of each person simply becomes a scalar measure of the constraints. Moreover, if everyone faced the same prices, and other pertinent circumstances – that is, of course, other than individual budgets – then why not base interpersonal comparisons on budgets, which could thus be viewed as scalar measures of the constraints that individuals face? To come full circle: if there were taste differences across individuals, comparisons based on welfare levels should be replaced by comparisons based on the size of budgets. However, this may be skirting the Arrow (or Lewisohn) problem; for the "island within" not only remains, but it might also remain inaccessible.

Still, as we have already intimated, like it or not, governments and other political bodies – whether or not they are, like Arrow, "seeking a basis for a theory of justice" – are constantly indulging in interpersonal comparisons of sorts when they attempt to ascertain what they consider to be consensus (not, of course, necessarily "extended consensus" in the Li sense) about a variety of matters.

5.   A Concluding Note

No "hard" solutions were promised. Since none were provided, the promise was kept.

Because the Bergson-Samuelson social welfare function is additive, inter-individual concerns are thereby excluded. But this assumption of "independence" with the consequent absence of inter-individual concerns cannot be reconciled with what should, on one view, be the rationale for the construction of a social-welfare function. More pertinently, as was contended in the present paper, the construction of a social-welfare function is predicated upon the existence of <u>individual social-interest functions</u>. Yet, such functions are absent from the Bergson-Samuelson context (thanks to the independence assumption). It would seem, then, that the Bergson-Samuelson social-welfare function in effect "transforms" individual welfare into social welfare without the back-up of compelling argument for the transformation.

The paper also took the position that the evaluation of "gains" and "losses" to members of the community resulting from the introduction of new policies and projects or departures from existing policies, cannot be undertaken in a way which is defensible unless welfare (or utility) is viewed as an in-principle cardinally measurable phenomenon.

Further, not only must the possibility of cardinalization be acknowledged when mounting exercises for evaluating gains and losses, but <u>interpersonal comparability</u> must be accepted as a legitimate notion. As regards "full" or ratio-scale comparability, it was demonstrated in the paper that such comparability is within the realm of the possible if recourse is had to the device of a "comparability set"; accompanied by the notion (or device) of "extended consensus", for both conceptualizing <u>and</u> getting operational with full comparability.

20

Notes

1. Some of the key details of this proposal derive from Li (1985).

References

Arrow, K.J., "Extended Sympathy and the Possibility of Social Choice", <u>American Economic Review, 67</u>, Feb. 1977, 219-225.

_____, <u>Social Choice and Justice, Collected Papers of Kenneth J. Arrow</u>. Oxford: Blackwell, 1984.

Becker, G.S., "A Theory of Social Interactions", <u>Journal of Political Economy, 82</u>, Nov./Dec., 1974, 1063-1093.

Bergson, A., "A Reformulation of Certain Aspects of Welfare Economics," <u>Quarterly Journal of Economics, 52</u>, Feb. 1938, 310-334 (and reprinted in American Economic Association, <u>Readings in Welfare Economics</u> [K.J. Arrow and T. Scitovsky, eds.], Homewood, Ill: Irwin, 1969, 5-25.

Deaton, A. And Muellbauer, J., <u>Economics and Consumer Behaviour</u>, Cambridge: Cambridge University Press, 1980.

Elster, J., "Social Norms and Economic Theory", <u>Journal of Economic Perspectives, 3</u>, Fall, 1989, 99-117.

Fleming, M., "A Cardinal Concept of Welfare", <u>Quarterly Journal of Economics</u>, <u>66</u>, Aug. 1952, 366-384.

Harsanyi, J.C., "Cardinal Welfare, Individualistic Ethics and Interpersonal Comparisons of Utility", <u>Journal of Political Economy</u>, <u>63</u>, Aug. 1955, 309-326.

Kuratowski, J., and Mostowki, A., <u>Set Theory</u>, Amsterdam: North Holland, 1968.

Li, C.M., <u>Pareto Optimality and Beyond</u>, unpublished Ph.D. thesis, McGill University, 1985.

Samuelson, P.A., <u>Foundations of Economic Analysis</u> (enlarged edition), Cambridge, Mass: Harvard

    University Press, 1985.

Sen, A., "Behaviour and the Concept of Preference", <u>Economica,</u> <u>40,</u> Aug. 1973, 241-259.

Smith, A., <u>Theory of Moral Sentiments,</u> New York: Kelley, 1966.

Vickrey, W.S., "Measuring Utility by Reactions to Risk", <u>Econometrica,</u> <u>13,</u> Oct. 1945, 319-333.