BASIC NEEDS AND DISTRIBUTION WEIGHTS

IN PROJECT CHOICE

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This paper reviews the Bank’s approach concerning the use of "distribution" weights in the social analysis of projects and compares it with a "basic needs" approach recently proposed by Mr. Harberger. It discusses the circumstances under which progressive distribution weights can be most fruitfully used, and illustrates various alternative assumptions that might be made in practice. Weighting schemes can be chosen for example to give primary emphasis to poverty redressal rather than to the reduction of inequality per se.

The Harberger approach differs from the Bank's approach in that it exclusively emphasizes the rich man's perception of poverty rather than the poor man's. Indeed the main beneficiaries of a basic needs project in that approach would paradoxically be the affluent group. However, the Harberger approach should often result in progressive distribution weights even though the underlying rationale is different. Moreover, income transfers between various parties do not cancel out in the Harberger approach and therefore social analysis must still be undertaken. The Harberger approach should not therefore be viewed as a substitute for social analysis but as suggestive of one possible approach to the determination of distribution weights.

The Harberger weighting scheme is very restrictive, without any clear compensating advantages, and it should not therefore be recommended for general use. The effects of poverty redressal on the affluent group can also be taken into consideration, when relevant, within the Bank's approach.

The paper also illustrates how the "basic needs" concept can be analytically integrated in social project evaluation.
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BASIC NEEDS AND DISTRIBUTION WEIGHTS IN PROJECT CHOICE

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I.

Introduction

1. Recently there has been considerable discussion regarding the appropriateness of using distribution weights in cost-benefit analysis of projects. These weights refer both to the relative valuation of consumption changes accruing to different beneficiaries at a point in time as well as to consumption changes over time (the savings "premium" issue). While distributional issues have been discussed occasionally in the literature on cost-benefit analysis, the current strong interest is due to several reasons: the development of an analytical framework to take account of distribution weights in a systematic manner, use of such weights by the World Bank in appropriate cases, and the growing recognition that traditional analysis has been unresponsive to the issues concerning redressal of poverty and inequality which are considered to be matters of great urgency in some countries.

2. Some of the major issues that have emerged in this context are as follows:

   (i) Is it possible to make judgments on welfare changes without reference (explicit or not) to distributional weights? Is traditional analysis really "neutral" with respect to distribution weights?

*I am indebted to Mr. H. G. van der Tak for comments on an earlier draft. He is not responsible for any errors remaining.*
(ii) Would the use of progressive distribution weights lead to "wasteful" programs (school lunches), or to paradoxical results (regressive income taxes)?

(iii) Is there a conflict between the "basic needs" concept and progressive distribution weights or can they complement each other?

3. These and other issues are briefly discussed in this note. We claim that in principle the use of distribution weights is unavoidable, and that if cost-benefit analysis is carried out properly in accordance with well-known rules then the use of progressive distribution weights cannot lead to wasteful projects and programs. We consider in particular the pragmatic context in which the use of distribution weights appear to be most fruitful. We note that emphasis on poverty redressal, rather than on inequality reduction per se, might be regarded as a special case of progressive weighting.

4. This paper approaches the topic from the somewhat philosophical angle, mainly because it is inspired by a recent seminar by Mr. Harberger along similar lines. In practice one would follow an alternative path. This would be to focus on a single country, or a small group of countries, determine the relevant objectives and targets and the various policy instruments available, and decide in that context whether a "basic needs" type of approach, or the use of progressive distribution weights, or both, would be desirable.
II. The Necessity of Distribution Weights

5. Distribution weights are unavoidable whenever gains to different individuals, or even the gains to the same individual occurring at different periods, need to be aggregated. Suppose for example that a project affects only two persons (A and B), and two time periods (1 and 2). The gains (or losses) can be represented in a matrix form as follow, writing $C_{1a}$ as the gain or loss in period 1 to person A etc.

\[
\begin{array}{c|cc}
\text{PERSONS} & \text{TIME} & \text{TIME} \\
\text{} & 1 & 2 \\
\hline
\text{PERSON A} & C_{1a} & C_{2a} \\
\text{PERSON B} & C_{1b} & C_{2b} \\
\end{array}
\]

Each project is associated with such a matrix of gains and losses. One cannot however decide that one project proposal is superior to another without defining a rule for aggregating the different elements of the matrix.

1/ For a somewhat different presentation of the same ideas see Ray (3).
matrix\textsuperscript{1/}. The weights necessary for aggregation may be referred to as
generalized consumption weights since we are not at this point taking
account of weights on specific consumption commodities.

6. In the standard cost-benefit analysis gains and losses to
different individuals receive equal weight. Thus, the net gain in
period 1 in the above example would be $C_1 = C_{1a} + C_{1b}$. An alternative
is to assume that a dollar is more valuable to a poor man than to a rich
man, i.e. the poor man's "marginal utility of income" is higher. If
person B is richer in our example, then his gain may be deflated or
discounted to reflect his lower marginal utility of income. Thus, if
'd' is such a discount factor then the net gain in period 1 would be
$C_1 = C_{1a} + d C_{1b}$.

7. The generalized weights are also of course needed to aggregate
gains over time. One possibility is to apply equal weights and add $C_1$
with $C_2$ (defined as in $C_1$ above) to measure total net benefits of the
project, i.e. $C = C_1 + C_2$. However, contrary to the practice of equal
weights for measuring benefits at a point in time, it is standard
practice to discount future gains. If 'd' is again the discount factor
then total net gains would be $C = C_1 + d C_2$. The reason for discounting
is also based on the idea of diminishing marginal utility of income
since one expects to be richer in future.

This discounting process also involves comparisons of gains to different

\textsuperscript{1/} Except in the uninteresting case that the values in each cell in
one option exceed the corresponding values in another option.
individuals, and indeed different generations, although this is not evident from our simple example.\(^1\)

8. No meaningful normative statements can be made without using a weighting rule of one kind or another. The choice of a weighting rule is unavoidably subjective and based on value judgments. This is of course as it should be because a recommendation that one way of using scarce resources is better than another is always a statement of values. This is not to say that project or policy evaluations must be erratic; the advantage of having a rule for weighting is to assure consistency in judgment.

9. It is wrong therefore to suggest that there is a "neutral" or "objective" weighting rule of some kind, as has been suggested, for example, by Mr. Harberger\(^2\). It is sometimes pointed out in this context that a dollar is a dollar in the market place, and isn't it true that a perfectly competitive economy would lead to socially optimum results? This, however, is no escape. Perfectly competitive economies do not, indeed cannot, exist except as a theoretical construct.\(^3\)

Secondly, the outcome of perfect markets, even if they did exist, would have no special claim to acceptance. The market system is a means to an end, not an end in itself, and one must therefore postulate the deeper social ends directly.

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1/ Many people believe that there is another rationale for discounting future gains, viz. pure impatience or time preference. This element does not however have the same intuitive appeal as diminishing marginal utility.

2/ See Harberger (2).

3/ See Arrow (1) for a review of the theories in this context.
10. A perfect market is quite consistent with great inequality of income and poverty. As an example, suppose person A earns $5000 per annum, and person B earns $100 per annum. Let us evaluate a project to provide A and B with the minimum level of nutrition necessary for survival. In accordance with standard practice the benefits of the project would be represented by the willingness to pay of the individuals; this would be $5000 for A and $100 for B, since it is safe to assume that both would pay their entire income if necessary to ensure survival. However, if the cost of providing the minimum nutrition per person exceeds $100 per annum then the equally weighted willingness to pay concept would indicate that person B should not be provided at all. Person B’s survival is 50 times less important to society because his income is 50 times less. Even if the market is perfect, in a case such as this most persons would agree that it would be reasonable to give B special weight since his utility from survival should not really be judged that much lower than that of A. This example may be regarded by some as an extreme case. However, the sentiment that is prominent in this case exist in less extreme cases also. Moreover, in terms of the reality in many developing countries this case is not too extreme. Severe deprivation appears to be a permanent feature for a large fraction of the populations in poorer developing countries.

III. Concept of "Waste"

11. Another point in this connection is that it is misleading to mix weighting rules. It is misleading to "estimate" the "welfare or efficiency cost" of meeting distributional targets if such measurements incorporate the equal weighting rule while the distributional targets imply a different weighting rule. The traditional metaphor runs in
terms of the extent to which the size of the GNP has to be wasted (welfare cost) to distribute it in a prescribed way (distributional gains).\(^1\)

The problem here is that the size of the GNP has no meaning independently of a weighting rule, and if one considers say, a progressive weighting rule to be appropriate then one should use that in measuring the size of the GNP in the first place.

12. Defining costs and benefits in terms of progressive weights does not mean that concepts such as 'waste' and 'least costing' become irrelevant. One still maximizes present value of net benefits, or minimizes costs for a given level of benefits; it is only that benefits and costs are now defined differently.

13. It is important to stress that the basic economic test for the acceptance of projects is as follows: "Among all feasible mutually exclusive project options choose the one that yields the highest net present value; if this is positive then the project is acceptable".\(^2\) Thus, there might be many projects which would yield sub-marginal economic rates of return but yet yield acceptable social rates of return at first sight. For example, an irrigation project in a backward area may involve such costly canals that the ERR would be very low; yet if the beneficiaries are poor enough and/or the consumption weights progressive enough then such a project might appear to have an acceptable social rate of return. However, it would be wrong to accept such a project unless all meaningful options have been explored, some of which may also yield high social benefits.

\(^1\) Strictly speaking changes in the GNP do not correctly indicate changes in welfare even if all gains are equally weighted because "consumer surplus" is not included in the GNP measure.

\(^2\) Note that the so-called without project option is one of the mutually exclusive options.
IV. The Basic Needs Concept Compared
With Progressive Distribution Weights

14. How do the Basic Needs approach, as defined by Mr. Harberger, really differ from the use of progressive generalized consumption weights? Is there any basis for Mr. Harberger's claim that his approach is in some sense morally superior to the use of progressive weights? Is the idea of basic needs inconsistent with progressive distribution weights? We try to address these issues below.

Analytic difference

15. In developing his concept of basic needs Mr. Harberger brings out the following important aspects:

- a Harberger-basic need (hereafter HBN), has an external effect which is inconsistent with Musgrave's "exclusion principle" in that it cannot be marketed. The market fails to work in providing an adequate level of HBN, just as in the case of an environmental improvement which everyone can enjoy free.

- the external effect of a HBN is entirely psychic. Mr. Harberger is not associating physical damage to the failure to provide a HBN. Malnourished children spread diseases and the treatment of such diseases cost money. The medical costs saved would be a benefit therefore of providing child nutrition. However, this aspect is not included. HBN is based on altruism and the willingness to pay of rest of society for a HBN might be best characterized as "conscience money".
- HBN is commodity and income group specific.

16. Analytically, HBNs imply interdependence among individual utility functions. Consider persons A and B. When B is provided with an increment in basic needs A feels better off; A feels better the lower is B's initial level of consumption of basic needs (given B's income), or the lower is B's income (given B's initial endowment of basic needs). In terms of the earlier example (para 10), person B's survival will be justified only if person A feels sufficiently better off as a result. If the cost of minimum nutrition is $500, then person B's survival must be worth at least $400 to person A if B is to survive. The value of person B's survival to himself will still be measured as only $100.

17. In contrast, in the progressive weighting system, the measurement of person B's survival to himself will be corrected directly, i.e. instead of being counted as $100 it would be counted as $w$.100 where 'w' is the relative social weight. Even if person A is indifferent to person B's welfare, the social weight might be sufficiently high to justify his survival. However, the two approaches will coincide in this example if the reason why the social weight 'w' is used is precisely that person A feels better off; indeed the value of 'w' could be determined on that basis. Viewed this way the Harberger approach might be regarded as suggestive of a special type of rationale for using progressive distribution weights in this example in which person B spends all his income on basic needs.

18. This similarity remains in effect even if not all of person B's expenditures are on basic needs. If, for example, 25% of B's expenditures are on non-basic goods then the weight on B's income will be 0.75 of the
weight applicable to the consumption of basic needs by a person at B's income level. Indeed as long as the marginal propensity to consume basic needs remains constant or declines with income, the Harberger weighting scheme will result in a progressive distribution weighting system. More importantly, income transfers will not cancel out in the Harberger approach, thus requiring a full scale social analysis.

19. To see this, let us develop the expression for the value of income transfers, both in the Bank's approach and in the Harberger approach. Let T be a transfer from the government to person B which is all consumed. Then the net value of the transfer, according to the Bank's approach is:

\[
V = \frac{\text{Social utility of cons. of } B}{\text{real cost of cons.}} - \frac{T. d}{v} - T. \beta,
\]

where \( d \) = social weight on B's consumption, \( v \) = value of public income, and \( \beta \) is the consumption conversion factor.

Now, let us assume that \( c \) is the marginal propensity to consume basic needs, and \( m \) is the utility generated to others (such as person A) when B increases his consumption of basic needs. By choice of units, define:

\[
m = \frac{m'}{v}
\]

Then

\[
V = T. \frac{d}{v} + T. \frac{c.m'}{v} - T. \beta;
\]

Or,

\[
V = T \left( \frac{d + c.m'}{v} \right) - T. \beta.
\]

\[
= T. \frac{h}{v} - T. \zeta.
\]
where \( h \) is a Harberger weight.

Now, even assuming \( d = 1 \), as Harberger does, it is obvious that \( h \) will decline with income since \( m \) declines with income, unless the marginal propensity to consume increases with income to offset the effect of \( m \).

It is not however reasonable to assume that the marginal propensity to consume basic needs will increase.

Moreover, even if \( V = \frac{1}{\beta} \)
(as Harberger probably assumes implicitly),
\[
V = T \beta, h - T \beta = T \beta (h-1)
= T \beta \cdot c \cdot m'
\]

Since different persons may have different propensities to consume basic needs and since \( m' \) will be different for different income groups, the value of a transfer to person B cannot be the same as the value of a transfer to person A. Thus social analysis will still be required.

20. The different utility concepts can be summarized symbolically as follows:

Approach A: Generalized Consumption Weights only; no interdependence of utility functions.

Social Welfare (\( W \)) = \( W(d_1 U_1, d_2 U_2, \ldots) \)

where the \( d \)'s are social weights on individual consumption, and the \( U \)'s are individual utility levels.
Approach B: Harberger Basic Needs Approach:

\[ W = W \left\{ U_1 \left( m_1^1 b_1, m_1^2 b_2, ..., \right), \right. \\
\left. U_2 \left( m_2^1 b_1, m_2^2 b_2, ..., \right) \right\} \]

where \( b_1, b_2, \) etc. represent levels of basic needs consumed by persons 1, 2, ..., and \( m_2^1 \) represent the utility weight that person 1 attaches to the incremental consumption of basic needs of some one at the income level of person 2, etc.

Approach C: Generalized Consumption Weights, but with interdependence of utility functions. Replace the \( b \)'s in Approach B with the utility levels \( U \)'s.

21. The approaches B and C are really different ways of defining "poverty" from the point of view of the affluent group. Approach A, views "poverty" from the point of view of the poor man; however, it can be made more general than that to allow for the rich man's point of view also. This can be done by making the weights, \( d \)'s, depend also on the effects of poverty redressal on others. Thus

\[ d_1 = d_1 \left( U_1, b_1, m_1^1, m_1^2, m_1^3, ..., \right) \]

where the \( m \)'s represent how others weigh the gain in welfare of individual 1.

**Determination of the weights**

22. Mr. Harberger appears to be concerned about the method by which the weights, whether on individual basic needs or on consumption-in-general, are determined. There is however no real difference in this respect. As he notes, the benefits accruing to others from the satisfaction of a
poor man's basic needs are very hard to measure. Indeed, by virtue of the fact that those benefits cannot be marketed, there is unlikely to be any reliable indicators of the beneficiaries' willingness to pay. One is likely to go far wrong if one tries to infer the rest of the society's willingness to pay from the donations they make for various charities, for at least two reasons. First, charities for meeting basic needs may not exist because of high transaction costs. Second, people would tend to pay far less than they otherwise would if they could be assured that others also would pay their due.

23. Moreover, experience does suggest that altruism is a weak force, and developing countries would be very unwise to rely on it to solve their poverty problems. Otherwise why is poverty so widespread? We are inevitably led to the conclusion that the satisfaction of basic needs must involve collective actions and that decisions to meet such needs or to redress poverty must to some extent be imposed from above. There is nothing wrong with society taking an enlightened, albeit somewhat paternalistic, decision. Social values, customs and codes always do have a degree of fiat in them. The decision to ban smoking in public places, to outlaw crime, or to have a democratic system are all noble decisions containing an element of fiat.

Is the HBN concept necessary?

24. Having seen that the HBN approach can be viewed as an indirect way of determining generalized consumption weights, and that the weights cannot be inferred from purely voluntary actions, is there really any need

1/ This is the so-called "prisoners dilemma", due to the characteristics of jointness of supply and non-exclusivity of public goods.
for that approach? If basic needs are defined as independent of income levels, and then combined with the use of progressive consumption weights, the end result would be pretty much the same. Consider an urban poverty project. Which services should be included in the project? It is conceivable that if the target group had free choice they would prefer to sacrifice the quality of the housing they would get in order to get a bar and a nightclub also. Exclusion of such amenities from the project in order to have higher quality housing means there is some "basic-ness" in quality housing. Moreover, the fact that the project would be considered better the poorer the target group, given fiscal constraints, implies that progressive consumption weights are being used. The end result is of course housing-for-the-poor, which might be a Harberger basic need. The reverse is not of course true. The use of the HBN approach would not lead to progressive weighting of that part of the income which is spent on non-basic needs.

25. In effect the HBN concept might be viewed as a means of taking account of (a) consumption externalities, and (b) diminishing marginality utility of income. It is however restrictive as such since it allows income weighting only jointly with consumption externalities. Considerable generalized freedom is lost if the analyst is not allowed to assume that the/consumption weights can be unequal; however, nothing much is gained by this sacrifice since

- information on income transfers and social analysis are still required,
- the weighting process is likely to be considerably more complex, and,
- there is no way of ascertaining the weights to be given on basic needs on the basis of market observations. The weights have to be assumed, and their reasonableness
tested empirically, just as in the case of generalized consumption weights.

Criticism of Distribution Weights

26. In his paper, Mr. Harberger criticises the use of progressive distribution weights by constructing several "examples". These examples appear to be rather beside the point and can be countered rather simply without going into details. We summarize below:

- It is alleged that the use of progressive weights will reduce income disparities too much. This is discussed subsequently in paras 31-35.

- It is claimed that in some countries the income tax structure is such that the use of progressive weights might result in a regressive tax structure. This is not a case against progressive weights but a case for re-examining the suitability of the income tax schedule.

- It is claimed that inefficient school lunches will be supported by those who advocate progressive weights. Whether a school lunch program is inefficient because it is a high cost operation or because it leads to cheating, there is no reason why such a program would be supported. One would explore alternatives, as discussed in para 13 above.

- Mr. Harberger points out correctly that the value of a subsidy to a poor person may be less than it is to the rich if the amount of the subsidy to the poor is sufficiently smaller than the amount of the subsidy to rich. However,
there is no paradox here as alleged. The distribution weights only imply that the value of a given amount of subsidy would be higher if it goes to the poor than to the rich!

- Indifference as to what to subsidize. It is true that the generalized consumption weights do not indicate which commodities are to be subsidized; of course not, that's why they are called generalized consumption weights! However, as discussed earlier they can be combined with the concept of consumption externalities. If milk generates external benefit then this can be added to the system. It has never been suggested that the use of distribution weights would mean no external effects are to be taken into account!

V. The Pragmatic Context

27. There is much to suggest that progressivity is considered socially desirable, even in advanced countries. It is certainly so considered in the context of public policy where poverty and inequality are pervasive. The use of progressive weights would reflect the attitudes and views in such societies. Nonetheless, use of progressive weights in public sector project evaluations would not still be necessary if there existed better alternative instruments of policy. The other policy
options, such as land reform and fiscal policy, are however often limited or severely constrained. The greater the poverty and the inequality problems, and the more limited the alternative policy options, the greater is the need to introduce progressive weights.

28. The social and political climate in many of the poorer developing countries is often such that policy makers and planners are pressed to use progressive weights implicitly. All project and policy proposals tend to be infiltrated by sentiments bearing on inequality and poverty. In that context the introduction of progressive weights, even if only rough, can help bring about much greater consistency and discipline than otherwise possible.

29. It is idle to think that even when one knows that progressivity is a major concern, the economist should merely present his analysis in terms of equal weighting and then let the policy makers take "non-economic" factors into account. Decision makers cannot introduce their judgments on "non-economic" factors in a rational manner unless economists show, via sensitivity tests, exactly how their results are affected by judgments concerning weighting of consumption gains.

30. Given the decision to use progressive weights in project evaluation, how are these weights to be determined? There are many options in this respect as discussed below. It should be noted, however, that the weighting scheme introduced need not be very precise, but need only be consistent with the fundamental notion of diminishing marginal utility of income.
31. The weights should also be regarded as "marginal". If poverty and income disparity in the country are serious issues and if other policy instruments are difficult to use then the use of progressive weights in project choice should move the economy in the right direction. The desired degree of progressivity should change over time as poverty and inequality are ameliorated. To use the popular jargon of shadow pricing, one should look for "second best" weights, not the weights which in some fundamental sense represent the ultimate general will of the country. Thus, one should not be disturbed by the fact that any consistently progressive scheme implies that, barring other considerations, it would be desirable to have complete equality. The whole issue will disappear long before complete equality is reached. The weights will change.

32. To illustrate further, note that if the weighting function is exponential, the weights become very large for those near starvation: the weights tend to infinity! One can of course avoid such tendencies by setting maximum and minimum values for the weights, but even if this is not done, would this mean that the country should stop everything else to distribute bread to all the poor? If poverty is at all widespread, any relief program will soon run out of money. The premium on scarce budgetary resources will soon become very high. Thus the high consumption weights will be offset by high weights on fiscal resources. The shadow price of fiscal resources can be considered constant only 'at the margin'.
33. Mr. Harberger criticises distribution weights on the basis of the exponential weighting system, which is one of many options. Moreover, his criticism of the weighting system, on the grounds that it would produce too much equality, is not valid because he misses the point about the marginality of weighting schemes just discussed.

34. There is another rather vexing issue of "projects" versus "policies". A project is a commitment to use scarce resources for certain purposes, and all policies also imply or induce such commitments. There is no analytic difference and therefore if progressive weights are used for "projects" there is no reason why they should not be used for "policies", noting that all relevant policy options must be explored in the process (para 13 above). However, the use of progressive weights should not be regarded as an all-or-nothing proposition. Consistent application over even a limited range of projects and policies should be better than nothing.

35. We now give some examples of weighting schemes. The Diagram below shows three types. Line AA shows the equal weighting of all consumption levels that is implicit in traditional analysis. Line BB shows a negatively sloped scheme which is consistently progressive in the sense that it displays diminishing marginal utility throughout. It is not however exponential. Line CC is an exponential scheme which also of course displays diminishing marginal utility throughout. The exponential line has the great advantage that it is fully described by a single parameter - its elasticity which is constant. A single parameter weighting scheme makes sensitivity tests easy, and it is difficult to see any advantage in using a function like BB rather than CC.
36. Many people do not think it is worthwhile to distinguish between income levels within the affluent group. A reduction in the Gini coefficient per se does not appear all that attractive. People are mainly concerned about the distribution between the rich and the poor. If so, a weighting scheme can be devised which gives equal weight to all those above a certain income level, and also equal but greater weight to all those below. This would be one way of emphasizing poverty redressal rather than reduction of income inequality per se. Poverty weighting may thus be viewed as a special case of progressive weighting.
37. We recommend that the analysts examine the issue of distribution weights in each country, in the light of its objectives, constraints and the availability of other policy instruments. There should be no command to use a fixed weighting scheme, whether the equal weighting scheme of traditional analysis or the more progressive weighting schemes that have been proposed in the Bank. Whichever weighting scheme is considered appropriate in the country context, the analysts should always allow for sensitivity tests.
References:

