INTRODUCTION

International Comparisons of National Incomes (ICNI) have been of considerable interest to researchers and policy makers since the early 1950s. Conventional method for ranking a country among the set of nations is to use "exchange rate" conversions of the GDPs of the various countries into a common representative currency. Since this method suffered from various limitations, which are discussed at length in Chapter I, many other important exercises have lately been carried out in this direction. The pathbreaking efforts of Kravis et al. (1975, 1978, 1982 etc) to calculate Purchasing Power Parities (PPPs) across countries with the aim of obtaining "real" estimates of GDPs, popularly known as ICP (International Comparison Project) are considered far superior for this purpose. One of its major advantages over the conventional method being that PPPs reflect the relative purchasing power of currencies while the exchange rates do not.

When GDPs were widely accepted as measures of economic development/growth and welfare of the people, it was natural for ICNI to acquire greater importance because of their presumed inherent capability to serve
two, theoretically known to be quite divergent, purposes. That is, they could be used as a Measure of Economic Activity (MEA) or productivity, which is the primary aim of these comparisons; and also as a Measure of Economic Welfare (MEW) of different nations. But when widespread scepticism prevails about the capability of GDPs in reflecting economic development and the welfare of the people, ICNI are likely to shed some of their previously acquired importance as now these can only reliably be used as a MEA and not as a MEW. In this respect the basic purpose of such comparisons, as perceived by some economists, gets defeated.

It is important to note that as intensive efforts were being made to improve the methods of ICNI, national income as an instrument to provide indication about the changing welfare pattern also started witnessing stronger doubts. These developments in turn necessitated the need for: (i) a clear and closer examination of the meaning of GDP and per capita GDP to precisely measure the welfare of the people; and (ii) making a separate ICNI as a MEW. Some significant efforts have been made in the recent past in (i) above but no statistical exercise has been performed to make
ICNI as a MEW and it is still deduced as a proxy from ICNI as a MEA.

It should, however, be noted clearly that the use of ICNI as a MEA as a proxy for a MEW was primarily made due to lack of specific statistical methods to make ICNI as a MEW; and limitations of the existing theory of welfare. For instance, the existing theory of economic welfare does not even permit interpersonal or international comparisons of welfare but statistical measures of welfare aim to achieve the same objective\(^4\). This, in a way, gives rise to a conflict between theory of welfare and its statistical measurement. Thus lack of theoretical support from welfare economics was/is likely to be a major hurdle in the way of developing ICNI as a MEW, which unless overcome, is likely to become one of the major limitations of any attempt to make ICNI as a MEW. This provides some explanation for the lack of efforts to make specific statistical attempts to quantify and compare welfare levels of different individuals/nations.

But given the fact that economic research is based on cardinal, interpersonal comparisons of apparent welfare and in matters of policy, we in fact make and apply interpersonal comparisons everyday, this induces
one to ponder whether flaws lie in economic theory or statistical measurement of welfare. It is felt that flaws in the economic theory of welfare are possibly responsible for flaws in the statistical procedures for the measurement of welfare. It, thus, becomes extremely important to analyse how existing theory of welfare can be improved to allow interpersonal or international comparisons of welfare; how irrelevant noise, incorporated in the measurements that are actually employed (statistical techniques) can be reduced; and how conflict between theory of welfare and statistical measurement of welfare could be resolved or minimised.

Some of the other important limitations of the existing theory of economic welfare which may also be the cause of the above mentioned limitation and which can also provide some valuable guidelines for improving it (theory of economic welfare) are as follows:

Firstly, the existing theory of social/economic welfare uses the prices and quantities of various economic activities as determinants of relation between economic activities and welfare of people without any attempt to distinguish among the nature and type of human needs which various economic activities fulfil and their (needs) respective Welfare Providing
Capacities (WPCs). The reason being that human beings have different needs which have different degrees of urgencies to them; and as economic activities are just means to satisfy these needs, they are certainly to have varying degrees of welfare providing capacities. Therefore, any discussion on welfare measurement and comparison is likely to be incomplete without any analysis of the nature and type of needs various economic activities serve and their respective welfare providing capacities.

Failure of the existing theory of welfare to take the above aspect into consideration seems to have prevented from making any value judgement about welfare increasing, welfare decreasing and welfare neutral characteristics of different goods and services or about their welfare influencing intensities. Consequently with the help of existing theory of welfare it becomes difficult to segregate goods and services which increase welfare from those which do not. This becomes clear from the fact that although we consider the consumption of few goods and services such as drugs, cigarettes etc. to be extremely harmful to human beings but we possibly do not have any theory of economic welfare base to say so. It, thus, also becomes impossible for the existing theory of economic welfare
to answer simple questions like: 'How increase in production and hence consumption may lead to decrease in welfare?' Not only that, the value judgements which we make about the welfare outcomes of various economic policies do not possibly have any support of the existing theory of economic welfare. For example, although we want distribution of income to be fair, we do not have any base of theory of economic welfare to say so.

Secondly, theory of welfare based upon prices and quantities reveals the preferences of the people who have the required purchasing power. But for welfare measurement and comparisons it becomes extremely essential to incorporate some value judgement about the preferences of people who do not have the required purchasing power. Failure of the existing theory of welfare to do so is also the cause of some of the problems mentioned above.

Thirdly, existing welfare theory does not provide a general and consistent procedure to account for various quantitative and qualitative differences that exist among different individuals/nations in resource endowment, needs, mode of production, size of the non-market sector, type and nature of goods produced and
consumed, cultural traditions, tastes of people etc. For reliable interpersonal and international comparisons of welfare it becomes extremely necessary to account for such differences and variations among individuals/nations. For example, if we want to compare the welfare level on the basis of cloth production and consumption of two nations, one with extreme cold and other with extreme hot weather, then it becomes necessary to account for the differences in cloth needs which exist due to differences in weather in these countries. It needs no explanation that country with extreme hot weather can enjoy the same or even higher level of welfare with much less per-capita production and consumption of cloth compared to country with extreme cold weather. Failure of the existing theory of welfare to make an in-depth analysis to account for the various differences and variations among individuals/nations to obtain their comparable welfare figures seems to have prevented clear differentiation: (i) between the needs of human beings and the needs of the economic system they live in; and (ii) the motive behind the production and consumption of various economic activities by different individuals/nations. From economic welfare measurement point of view, (i) and (ii), in turn, are probable
reasons for our failure to formulate a general procedure for differentiating various economic activities as final, intermediate etc. which is a prerequisite for the measurement of welfare and its cost.

Lastly, the adoption of the presumption by the existing theory of economic welfare that there is a direct relation between economic and social welfare may not be true.

The main points which follow from the above discussion are:

(i) ICNI as a MEA, based particularly upon exchange rate conversions of GDPs of different countries into a common currency (most widely used procedure) and ICP approach (which is presently accepted as the most reliable method of ICNI as a MEA), may not provide a reliable proxy for ICNI as a MEW; and

(ii) A specific measure of economic welfare necessitates reformulation of the existing theory of economic welfare - theory which is free from the above discussed limitations. In the economic literature we do come across suggestions about a desired approach for measuring economic welfare
and need to reformulate the existing theory of economic welfare on these lines. But no significant effort has been made in this direction. In line with some of these suggestions an attempt is made in the present study to reformulate the existing theory of economic welfare based on human needs which various economic activities (goods and services) fulfil. It has been felt that this can prove to be extremely rewarding in removing some of the major imperfections and inconsistencies of the existing theory of economic welfare and, thereby, in the reformulation of statistical techniques specifically aimed at measuring welfare levels of different individuals/nations.

The main objectives of the present study can be summarised as:

(i) to test the suitability of some of the earlier methods of ICNI as a MEW viz. the use of exchange rate conversions of GDPs of the various countries into a common currency; and PPPs and product comparisons to be used as a proxy for ICNI as a MEW;

(ii) to provide theoretical justifications for the need to improve the existing methods of ICNI as a MEA
to derive ICNI as a MEW;

(iii) to form a strong microeconomic base for the theory of economic welfare and suggest an improved theoretical procedure for the measurement of welfare based upon usefulness of goods and services to human beings - procedure which can: categorise various economic and non-economic activities as welfare increasing, welfare neutral and welfare decreasing; help to make reliable value judgements about the WPCs of various economic activities; and also account for various differences and variations which exist among individuals/nations;

(iv) to apply the improved theoretical procedure for the measurement of welfare to suggest a more realistic statistical technique for making ICNI as a MEW giving rise to consistency between theory of welfare and its statistical measurement; and

(v) to suggest ways in the light of improved statistical technique for the measurement of economic welfare, to improve the ICP data which primarily provide ICNI as a MEA to derive reliable and specific MEW for 58 countries and compare these with the corresponding figures of GDP per capita or per capita ICP values to achieve (i) above. Moreover, MEW values are also used to derive
inference about: (a) inter-country variations in MEW and costs in the countries considered; and (b) the relation with economic development (which is always associated with increase in the level of economic activity or GDP per capita) on the one hand and MEW and costs on the other.

The following chapter scheme is adopted to carry out these objectives.

The initial chapter is devoted to brief review and critical analysis of the various empirical exercises for: (i) making ICNI as a MEA which are/were also used as a proxy for a MEW; and (ii) for measurement and comparison of economic welfare.

Chapter II presents a detailed discussion on how failure to distinguish among the various sources of welfare and its different forms has led to an incorrect perception of social welfare in general and economic welfare in particular.

In Chapter III an attempt is made to formulate an alternate cardinal utility function based upon human needs and their usefulness to human beings.

Chapter IV presents the type and nature of adjustments, modifications and supplementations which
become necessary in a MEA if a MEW is to be derived from it.

An alternate statistical procedure to derive a MEW from a MEA and other statistical methods adopted in the present study are presented in Chapter V.

The sixth Chapter presents the results of the empirical analysis and their interpretation.

Summary and conclusions are discussed in the last Chapter.

NOTES

1. The distinction between National Income as a measure of productivity and National Income as a measure of welfare was first pointed out by Hicks in 1940. Moreover, as National Income statistics can be used for different purposes, the right systems of weight to be used for valuation of the National Income depends upon the purpose for which the calculations are to be used. Since selection of weight is of overwhelming importance, it has been felt that for realistic estimates they (weights), in general, need to satisfy certain requirements. They should, for example be: (1) stable; (2) empirically usable; (3) broadly acceptable; and (4) based upon a firm economic theory. For details see Sen(1979,P.31).

2. Beckerman (1974,P.80) clearly reveals that the fundamental overall purpose of the ICP type of data or ICNI is to make possible cardinal international comparisons of welfare. See also Marris(1979,p.19).

3. Some contributors to this line of thinking are Galbraith(1958), Mishan(1967), Boulding(1970),

4. This follows from Arrow's (1963) impossibility theorems. But we follow Sen, A.K., who is a strong critic of the impossibility theorems. See for details Sen (1966, pp. 75-79).

5. For a comprehensive analysis of the relation between market prices and welfare, see Usher (1968).

6. Flaws in the earlier statistical procedures of welfare measurement, thus, can also be traced back to the adoption of market prices without any adjustment for the nature of human needs various economic activities fulfil and their respective WPCs.

7. Impact of income distribution on welfare has been considered to be very important for ICNI, see Sen (1976, pp. 387-403).

8. For importance and need of these see Studenski (1961, pp. 207-209) and UNO (1968, pp. 58-61).

9. See footnote (3).

CHAPTER - I

INTER-COUNTRY COMPARISONS OF INCOME AND WELFARE
A REVIEW

There exist several problems in: (i) making ICNI as a MEA which is also used as a proxy for ICNI as a MEW; and (ii) statistically measuring and comparing economic welfare. Many theoretical and statistical attempts have been made in these areas which can broadly be divided into three categories:

(a) Exchange Rate Conversions (both market and PPP) and ICNI;
(b) Short-Cut methods of estimating GDPs and international comparisons thereof; and
(c) Methods to measure and compare welfare of different countries

This chapter reviews each of these with a view to evolving a new MEA aimed at making ICNI as a MEW under the present international economic scenario. Section I deals with (a), Section II with (b), and Section III with (c).

SECTION I

Although the theoretical distinction between national income as a MEA and as a MEW was pointed out long ago by Hicks (1940), the two continued to be
considered synonymous in practice largely due to various conceptual and statistical limitations. One set of various empirical attempts to compare the welfare level of different countries based upon this synonymity makes use of exchange rates (both official and PPP) to make GDPs/Product comparisons of different countries. The main methods in use in this category are:

(i) The most obvious and simple method for obtaining comparable national income and per capita national income figures of various countries is to take each country's national accounts measures of, for example GDP, and convert it to a common currency using the relevant exchange rate. This method is most commonly applied for ICNI or for international comparisons of per capita income. It is, however, well known that this procedure is liable to be misleading as it can give rise to systematic errors and can cause serious distortions due to the following reasons. Firstly, national accounts are not to be taken as precise statistics, and in any case they are not always compiled on an identical basis. Secondly, many countries operate a number of exchange rates, depending on the class of transaction. And foreign exchange controls,
export and import duties and quotas, transportation costs, movement of capital etc. also generally distort the price relationships of different countries. As a consequence, this procedure provides no way to measure the relative prices of goods and services that circulate within the given countries. Finally, the claim that international trade will lead to equalisation of the prices of non-traded and traded goods appears dubious in practice. Consequently, even the free market exchange rates will only provide the conversion factor for traded goods\(^1\). On account of these reasons there was considerable interest in looking at alternate and possibly more reliable methods of comparing income levels;

(ii) The best known of these alternate methods is the Purchasing Power Parity (PPP) method. The basic idea of this method is that limitations of the first method can be overcome and comparability of GDPs or per capita GDPs can be substantially improved if PPPs rather than official exchange rates are used for the conversion of national income estimates of different countries. It was:

(a) initially suggested in the study of the
Organisation of the European Economic Cooperation (OEEC) reported in Gilbert and Kravis (1954); and (b) its most recent and comprehensive realisation is in the United Nations International Comparison Project (ICP), reported in Kravis et al. (1975, 1978, 1982, 1986 etc.)

(a) The main emphasis of OEEC study was to make binary comparisons of incomes of the US, the UK, France, Germany and Italy by identifying 'about 250 goods' that were comparable among the countries considered. The purchasing power equivalents were computed for each product in terms of European currency per unit of US dollar and were weighted together and applied to GNP product class total for each product.

With this method there are two problems. Firstly, such inter-country comparisons do encounter fundamental index number problem which exists in intertemporary comparisons. This is the usual problem of the choice of weights. For instance, in the production indices the apparent relationship between the volume of total production in two years may well vary substantially according to whether the quantities produced in the two years have both been valued in the prices of the first year or another and vice versa for price indices. The
intensity of the index number problem for intertemporal or international comparison of quantities and price indices will, naturally, depend upon the intensity or size of intertemporal or international variations in these variables. Secondly, binary comparisons are likely to become inappropriate in the light of the large number of countries ultimately to be included in the network of comparisons. Through binary comparisons it was not possible to establish a unique cardinal scaling of the countries with respect to real income. In general, a set of binary comparisons in which each country is compared directly with the other is likely to lose the property of transitivity.

(b) The presence of potential intransitivities and instability in the binary comparisons necessitated the development of some alternate approach which is free of these handicaps. This need was fulfilled by the International Comparison Project (ICP) which have their origin in the study of the OEEC by Gilbert and Kravis (1954) and which represent the most recent and comprehensive efforts in the category of the use of PPP method of ICNI. Their estimates are currently considered to be the best.

The study is based on the fact that actual work of
the international comparisons consists mainly of making price comparisons, which, in turn, can be made by the use of the price-times-quantity-equals-expenditure relationship and the breaking down of GDP in terms of its final product components rather than in terms of producing industries. Thus the study aims at:

(i) subdividing GDP into categories for which expenditure data and price comparisons could be obtained;
(ii) selecting and pricing a sample of specifications for each expenditure category;
(iii) aggregating the price relatives at the category level; and
(iv) aggregation of the categories to form price and quantity indices for GDP and its sub-aggregates.

The formula chosen in the ICP is one which is based upon the idea that if a common set of international prices, denominated in terms of some numeraire (conventionally US dollar) is obtainable, then it is conceptually simple (although in practice, time consuming and expensive) matter to put the national accounts of all countries on a common basis in terms of the numeraire currency. The question therefore is whether it is possible to obtain such a set of international prices.
Essentially there are two problems here: (a) prices in different countries are expressed in terms of different local currencies, and, even if available, market exchange rate will not in general provide a reliable method of conversions between currencies; and (b) relative prices, which are unit free, will vary between countries (this, of course, is the fundamental index number problem). If one is prepared to ignore (b), then a solution to (a) can be obtained by a formula, which was suggested by Robert Geary and amplified by S. Khamis (1972). This formula involves price comparisons and the average world prices simultaneously in two subsets of equations. The Geary-Khamis formula is the source of the set of international prices used in the ICP estimates. Thus the formula chosen in the ICP is one which, in principle, values the quantities of goods in each category's GDP at world average prices. These values when summed yield the desired real income comparisons for components of real income. As ICP system uses only one set of price weights which are achieved by selecting weights that represent some kind of average of the relative prices observed in the countries studied, it is free from the limitations of the binary comparisons. This procedure is designed to bring
intercountry comparisons in line with intertemporal real value comparisons that are based on constant price series.

Data of ICP consists of quantities and prices for 151 goods eventually in different countries. The results of the project have been organised in different phases. Phase I, published in 1975, related to 10 countries: 6 developed, 3 developing and 1 centrally planned country (Hungary). Phase II, published in 1978, added 6 countries including 4 developing countries. Phases III and IV published in 1982 and 1986, added 18 and 24 more countries, respectively, of various categories. A total of 64 countries participated in the ICP Phase V exercise³.

Besides other important results, ICP provides; (i) binary real GDP comparisons of each country with US, using own country price weights and US price weights; and (ii) multilateral international comparison of GDP of each country, which are valued at a standard set of dollar prices namely a quantity weighted average of the corresponding prices in the world economy estimated from the prices displayed among the different countries.
The main finding of the study is that the PPP conversions tend to be higher for lower income countries. That is, poor countries tend to have lower price levels; their exchange rates understate the purchasing power of their currency. Its consequence is that the spread between the average incomes of the countries greatly diminishes when PPP conversions are used.

The study reveals that errors caused by official exchange rates compared with the ICP method range from 200 to 300 per cent when comparing developing countries with developed countries; from 30 to 50 per cent when comparing amongst developing countries and 20 to 40 per cent when comparing amongst developed countries.

The above discussion clearly depicts the novelty and usefulness of the ICP approach to the problems of national income measurement and comparisons. It solves many of the often raised problems in this field and its estimates of per capita GDPs are currently considered to be "best available". However, owing to the considerable expense and practical difficulty associated with PPP estimation, it is unlikely that such estimates will be available for all countries at least for a long time. So the need for some short-cut
procedure was felt to interpolate PPP figures for those countries for which systematic information is not available. In any case, this problem will always exist for periods prior to the last two decades.

SECTION II

There are two approaches in the literature of the above mentioned short-cut procedures to interpolate PPP figures for different countries, particularly for which no systematic information is available.

(i) If one can derive a reliable relationship between nominal per capita GDP (that is, national currency estimates converted by using market exchange rates) and PPP estimates for those countries for which one has the latter information, one may use this relationship to infer the PPP estimates for the remaining countries. This is the approach adopted by Kravis et al. (1978) and Summers and Heston (1984, 1988). The main conclusion of these studies is that short-cut estimates come closer than the exchange rate conversions to what full benchmark studies would yield, much closer for low and middle income countries. Moreover it is strongly felt by these authors that their procedures are likely to provide a more lasting solu-
tion to this problem because of the problems with benchmark studies as discussed earlier.

(ii) One may attempt to derive estimates of per capita GDP using economic and social indicator data.

In this category there are two main statistical approaches to the use of indicators in the estimation of per capita GDP. The first approach, exemplified in the UNCTAD(1970) study, is to apply multivariate statistical techniques to a large body of indicator data, and, in particular, the principal components and factor analysis models have been used. Essentially this approach supposes that the major factor underlying values of the various indicators for a particular country is its per capita national income. Clearly that will only be the case if the indicators are judiciously chosen, but even granting this, it is not apparent that the isolated factor will reflect the desired aggregate rather than, for example, the extent of industrialisation or some generalised measure of the development of the economy.

The second major approach to per capita GDP estimation utilising indicator data is that developed by Beckerman (1966) and Beckerman and Bacon (1966,1970)
and relies on the standard multiple regression model. In this approach it is necessary that reliable estimates of per capita GDP be available for a sub-set of countries and the resulting estimated regression is then used to interpolate the levels of per capita GDP for the remaining countries.

Indicator methods are surveyed in Heston (1973) and statistical methodology underlying the use of indicator techniques in the estimation of per capita GDP, and variants of these procedures that went some way to overcoming the methodological inadequacies of the basic procedures are discussed in Gilbert (1980).

It is interesting to note that Gilbert (1984) employed the Kravis et al. procedures, the principle components and factor analysis variants of the indicator procedures, and a modified Beckerman and Bacon technique to extrapolate the ICP purchasing power parity per capita GDP estimates to a set of 118 countries. Their overall conclusion is that the factor analysis and principal components procedures performed very poorly while the Kravis et al. procedure performed best for developed economies and modified Beckerman and Bacon procedure performed best for developing countries. Their analysis reveals that there is some limited evidence to show that calculations based on
nominal GDP figures have tended to underestimate the growth over the decade 1960-1970 of GDP in the least well off areas of the world, and consequently, exaggerate any movement towards greater world inequality.

One major problem that arises in the use of all the indicator based procedures is that of missing indicator values. Since different countries collect with varying efficiency information on different quantities for different purposes, the missing values are likely to form a very considerable proportion of the total. This problem is serious and is compounded by the fact that the pattern of missing values is unlikely to be random. Moreover, a difficulty with the Beckerman and Bacon procedure that arises, particularly, when there is a large number of indicators available, is the method by which the set of indicators, to be included in the regression as explanatory variables, is selected. Generally a choice will be necessary here since the number of potential regressors will be considerably in excess of the number of countries in the sample for which we have purchasing power parity GDP estimates.

The main limitations of the ICP approach (as well as short-cut methods) for
welfare measurement and comparison point of view is that it fails to measure welfare correctly and therefore may provide imperfect, inconsistent and biased estimates of ICNI as a MEW due to the following main reasons. Firstly, it does not make any adjustment for variations in resource endowments, needs, mode of production, size of the non-market sector, type and nature of goods and services etc. of different countries which are considered to be extremely important for welfare comparisons. Secondly, it makes no effort to assess the potential inclusion and exclusion of goods and services in measured economic activity of various countries that become necessary to specifically measure welfare. No mention of the type and nature of adjustments and modifications that become necessary from usefulness of goods and services point of view has been made, without any reference to which any discussion on welfare measurement and comparison is incomplete. Thirdly, it does not take distribution of income into consideration. Finally, this approach does not directly relate human capital to a MEW in the same way that adjustments have been noted (made) for physical capital.
SECTION III

Inspite of the fact that ICNI as a MEW as deduced from ICNI as a MEA through the use of exchange rate conversions and product comparisons were statistically accepted as suitable techniques and in fact were/are commonly used, the need to have a separate method to empirically measure and compare welfare always persisted in some minds and intensity of this need increased as dissatisfaction about the use of economic activity for a proxy for happiness or economic welfare grew. Basic idea behind this dissatisfaction was that GDP is not the correct measure of economic welfare and an increase in GDP may not always be a source of increased economic welfare. Some economists strongly feel that blind obeisance to increase national income with an aim to increase economic welfare without any consideration for its costly side effects can distort national priorities, worsen the distribution of income and irreparably damage the environment. Therefore various attempts to reveal the welfare produced by the economic systems of different countries with the help of some other variables considered to be important from social and economic point of view were made. These can best be described from a quote from Fred Hirsch (1977, P. 63)
Attempts to indicate net or final output, or the welfare produced by the economic system, have had to resort to the avowedly unsystematic measures yielded by "social indicators". These comprise a hybrid collection of indicators of various facets; of mortality rates (rather than money spent on doctors and hospitals); contentment and safety as indicated by the inverse of suicide and accident rates (as distinct from spending on prevention services and safety devices); air quality as indicated by pollution content (as distinct from spending on anti-pollution devices)."

In addition to these an important effort in which indicators of infant mortality, life expectancy, and basic literacy have been used as the components of a composite "Physical Quality of Life Index (PQLI)" to measure performance in meeting the most basic needs of people have also been made. But all the above mentioned empirical exercises suffer from various limitations which are beautifully described by Fred Hirsch (1977, PP.63-64).

"The significance of these social indicators is limited for first by the statistical difficulty of finding measurable proxies for the "output" that is to
be assigned; and second, by the absence of any common unit of measurement to link and aggregate the separate measures, comparable to that of money in GNP. This lack of weighting system for social indicators is a conceptual limitation for which no solution is in sight".

But two important studies which are partially free from the above mentioned limitations are worth discussing.

(i) An attempt has been made by Sen (1970, 1976) to develop a general approach to real income comparisons (basic aim of which is thought to be comparisons of economic welfare rather than economic activity) by making distribution of income as an integral part of such comparisons.

Basic format of the analysis is that:

(a) the same commodity going to two different persons is treated as two different goods so that weights of goods may incorporate distributional judgements; and

(b) as real national income comparisons involve different groups of people, an attempt has been made to provide a rigorous treatment of the alternative
interpretations of real income comparisons arising from such differences. The results of the exercise are then used for inter-state comparisons of real income in India.

It has been argued by Sen (1976) that his approach "permits the treatment of real national income comparisons as generating a partial ordering of a complete welfare indicator rather than a complete ordering of a partial welfare indicators (and distribution)" (p. 32).

It will be shown in the forthcoming chapters that if human needs and their WPCs are taken into consideration, besides the above purposes more purposes will be served.

(ii) The study by Nordhaus and Tobin (1972) which happened to be the first serious quantitative attempt to adjust, modify and supplement the Income and Product Accounts for the kind of welfare producing activities, both positive and negative, that are either not included as part of real product or are included as final rather than intermediate.

Nordhaus and Tobin have constructed a MEW. Basic idea behind this is that it is consumption rather than
production which is the source of real welfare, and their emphasis is to develop conceptually and statistically a measure of consumption. As GNP is an index of production, their MEW is largely a rearrangement of items of the national accounts in which they have attempted to allow for the more obvious discrepancies between GNP (production) and economic welfare (consumption).

Their adjustments fall into three general categories:
(a) Reclassification of GNP expenditures as consumption, investment, and intermediate;
(b) Imputation for the services of consumer capital and leisure;
(c) correction for some of the disamenities of urbanization.

In (a) the basic aim is: (1) subtraction from GNP some items that are better regarded as instrumental and intermediate than as final output. Main idea is that these items are not directly sources of utility themselves but are 'regrettably' necessary inputs to activities that may yield utility; and (2) to allocate all remaining items between consumption and net investment.
On this basis they classify depreciation of capital stocks as cost of production, and output required to offset depreciation as intermediate; education and health expenditures, both public and private, as capital investment; and defence expenditures, police protection expenditures as regrettable and instrumental. They estimated that overhead and regrettable expenses rose from 8 per cent to 16 per cent of GNP over the period (1929-65, P.12).

In (b), that is, for imputation for leisure and non-marketed activities, they suggested that market consumption "deflator" should be used if technological progress has augmented non marketed use of time to the same degree as marketed labour and wage rate effectiveness of unpaid time (p.11). In their MEW the value of leisure is deflated by the wage rate; and the value of non marketed activities, by the consumption deflator.

In (c) the basic idea is that many of the negative "externalities" of economic growth are connected with urbanization and congestion. The secular advances recorded in NNP figures have accompanied a vast migration from rural agriculture to urban industry. Without this occupational and residential revolution we could
not have enjoyed the fruits of technological progress. But some portion of the higher earnings of urban residents may simply be compensation for the disamenities of urban life and work. If so, we should not count as a gain of welfare the full increments of NNP that result from moving a man from a farm or small town to a city. They have tried to estimate by cross-sectional regressions that income differentials necessary to hold people in localities with greater population densities. Their estimated disamenity premium turns out to be quite substantial, running about 5 per cent of GNP (P. 213).

Their study makes the following important observations:

(i) MEW is quite different from conventional output measures. Some consumption items omitted from GNP are of substantial quantitative importance.

(ii) Their preferred variant of per capita MEW has been growing more slowly than per capita NNP (1.1 per cent for MEW as against 1.7 per cent for NNP at annual rates over the period 1929-65). Thus both have been growing and therefore the progress indicated by conventional national accounts is not just a myth that evaporates when a welfare orient-
ed measure is substituted.

In their words, the main answer to "Is Growth Obsolete? We think not. Although GNP and other National Income aggregates are imperfect measure of welfare, the broad picture of secular progress which they convey remains after correction of their most obvious deficiencies" (P. 24).

The main limitations of the Nordhaus and Tobin study, which is the first quantitative attempt to measure and compare welfare are as follows. Firstly, it lacks the base of the theory of economic welfare. Secondly, no adjustments for welfare contents of goods and services based on usefulness of goods and services to human beings have been made. Thirdly, it does not measure cost of achieving the acquired level of economic welfare. It needs to be noted that any attempt to measure economic welfare is bound to be incomplete without measuring its economic cost—particularly when aim is to make comparisons of economic welfare of different individuals/nations. Fourthly, this approach does not directly relate human capital to a MEW in the same way that adjustments have been made for physical capital. Fifthly, this approach does not make any adjustment for variations in resource endowment, needs, mode of production, size of the non-market sector, type
and nature of economic activities etc. which are thought to be extremely necessary for welfare comparisons. And finally, adjustments and modifications suggested and made are not perfect. There are some more adjustments and modifications that become essential for measurement and comparison of welfare.

Due to foregoing reasons it is felt that inspite of the fact that the answer to the question: "Is Growth Obsolete?" by Nordhaus and Tobin is 'no' and their main conclusion in that progress indicated by conventional national accounts is not just a myth that evaporates when a welfare oriented measure is substituted, this may not necessarily be true if the above discussed adjustments are made. In fact, this has been the motivating force behind the present study.

Summarising this chapter it can be said that whereas GDP per capita is an imperfect measure of economic welfare, other approaches to specifically measure economic welfare still suffer from various limitations implying thereby the existence of sufficient scope for improvement in this field.
Notes:


2. More on it is discussed in Chapter V. See also Khamis (1984).

3. Reports on Phases V and VI, as becomes clear from the World Development Report 1993, P.325, have also been Published. But despite best efforts these could not be procured.


5. See for details Gilbert (1984), Beckerman and Bacon (1966, 1970) Short-cut methods of ICNI has also been used in Clague (1986).

6. ibid

7. See Sen (1976) for details.


9. See footnote (3) of Introduction.

10. For more on quality indicators see Larsen and Wilfred (1980), Blackorby and Donaldson (1980).

11. For more on welfare significance of ICNI as a MEA see Sen (1979) and references there in, UN (1977), Fell and Greenfield (1983), Alder (1982), Holub (1983), Weitzman (1976).

12. These are discussed in detail in Chapter III.