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ASPECTS OF POST WORLD WAR II GROWTH IN
LESS DEVELOPED COUNTRIES

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ASPECTS OF POST WORLD WAR II GROWTH IN
LESS DEVELOPED COUNTRIES*

Simon Kuznets

1. Introduction

In this paper we deal with selected aspects of economic growth since World War II in developing (less developed, or LDC for short), contrasted with developed (or DC) market economies, excluding the centrally planned or Communist countries (which in 1972 accounted for some 1.2 of 3.7 billion of world population).¹ This exclusion is due partly to difficulties of securing comparable and meaningful estimates for these countries, particularly for the giant among them, Mainland China: but largely to problems involved in the analysis of economic growth in countries in which the trade-off between economic gain (in output or power) and individual welfare and freedom is so different from that in the less centralized market economies.

The LDCs are the countries in Asia, Africa, and Latin America that are characterized by low income per capita and a production structure that suggests a marked shortfall in exploiting the opportunities provided by modern technology. According to the World Bank Atlas, of the 1.85 billion people in the "developing" countries in 1972, close to 1 billion were in countries with an average per capita GNP of \$110, and another 0.27 billion were in countries with "middle income" i.e., a range of per capita GNP between \$200 and \$375, and an average of \$260. By way of contrast the average per capita income for developed or industrial market economies, with a population of 0.66 billion, was over \$3,500.² United Nations estimates, a major source of comparative data,

*Preliminary draft of a paper to be presented at a conference at Vanderbilt University in late October, 1975.

differ in detail of classification from those of the World Bank; but for our purposes, which involve general orders of magnitude rather than detail, the two sets of estimates are fairly comparable.

Our interest is in the growth of the poor LDCs. Not all the countries classified as "developing" by either the World Bank or the United Nations are poor, the striking exception being the oil sheikdoms with small populations and enormous oil revenues. Nor are all the countries classified as "developed" rich, as illustrated by several countries in Southern Europe. There is a twilight zone where a more discriminating classification would place countries that are backward but rich, those that are in the process of movement from LDC to DC status but have not yet attained the latter, and still others that may have regressed from apparent DC status (possibly illustrated by Argentina). But these intermediate or mixed groups do not loom large enough within the LDC or DC categories to modify substantially the broader parameters of size, structure, and growth - particularly when we emphasize, as we should, the population weights in any aggregation of countries for establishing the growth of total and per capita product for large groups.

The broad topic covers a wide field, for which, over the last quarter of a century, an enormous body of data, both descriptive and analytical, has accumulated. Indeed, it is hard to exaggerate the explosive acceleration in the flow of data and range of studies in this field, which before World War II was not of primary interest even for the developed countries and practically neglected for the rest of the world. No single scholar can deal with it either comprehensively or with

full balance, and particularly within the limitations of time and space warranted on this occasion. The discussion that follows represents an individual's reflections on some of the questions raised by the broader type of aggregative evidence and analysis.

2. Diversity and Aggregation

For the LDCs as a group, the United Nation has estimated annual growth rates of total and per capita GDP (at constant factor prices), from 1950 to 1972.³ The growth rate of per capita product was 2.5 percent per year from 1950 to 1960, and 2.7 percent from 1960 to 1972; and the combined rate for the 22 years was 2.61 percent per year. If this rate were sustained, per capita product would double in about 27 years; and the implication is that between 1950 and 1975 per capita product must have risen by about 90 percent. For the poorer and most populous LDC region distinguished in the UN estimates back to 1950, East and Southeast Asia (excluding Japan), with a population by 1972 of over 1 billion, the growth rates in per capita product for the same two periods were 1.9 and 2.2 percent respectively, yielding a combined rate of 2.04 percent--which implies a rise of close to two-thirds over 25 years and a doubling in a period somewhat short of 35 years.

Such growth rates are quite high, in the long-term historical perspective of both the LDCs and the current DCs. While the historical data for the LDCs rarely provide a firm base for judging their long-term growth, the low levels of per capita product that characterize these countries in the early 1950s and even in the early 1960s clearly imply that rates of growth that mean doubling in a period from 27 to 35

years could not have prevailed in the long-term past. For such rates, if applied to the years before the 1950s, would have meant impossibly low levels of per capita product and consumption at the beginning of the preceding quarter of a century. And for the current DCs, for 16 of which we have measures of long-term growth, the observed rates are generally well below those cited for the LDCs in the paragraph above. For periods extending from at least half a century to the long period of their modern economic growth, Sweden, over the last century, and Japan, back to the late 1870s, are the only two of the 16 countries with growth rates in per capita product that approached or slightly exceeded 29 percent per decade. Indeed, they are the only countries with growth rates above 22 percent per decade (unless one counts Italy, back to 1895-99, with a rate of 23 percent).⁴

If growth rates in the per capita product of LDCs over almost a quarter of a century were so impressively high, one may ask why the reaction to them, in the general flow of news about these countries, in the persistent concern about critical conditions with respect to supplies of economic goods, seem to ignore these growth achievements. The news, reactions, concerns, are not sufficiently tangible to be susceptible of easy quantification, and one cannot measure this state of concern and response sufficiently to be able to see how they reflect economic movements of the magnitude cited here. It may well be that a rise in expectations has produced a negative reaction to economic attainments, which otherwise might have elicited litanies of praise for economic "miracles." And indeed references have been made to

such miracles for some limited periods and countries, in contrast to the more prevalent references to acute problems in the LDCs, and the recurring flurries of concern among international agencies and developed countries over economic deprivation and dangers of collapse in the "third" world. Perhaps the emphasis on the flow of news on the troublesome rather than favorable items in the stream of current events, combined with the easier accessibility and wider communications, introduced a bias in recent decades that tended to conceal economic advance of major proportions. Still, even if we find, as we may later, grounds for inferring that there has been a change in expectations, and hence in the bases for evaluating the adequacy of modern economic growth, we should still examine critically aggregative measures of the type noted above. They may conceal more than they reveal, and the various kinds of aggregation that yield such measures may contain biases that should be identified, and their magnitude should at least be suggested.

This examination cannot deal with the question of accuracy of the basic underlying data, country by country, or even for a selected sample. The question is particularly relevant to the statistics of the LDCs, where the brevity of the period over which basic data have been collected and the limited scholarly resources for their analysis, combined with the difficulties of proper quantification of processes that do not naturally yield measurable results, limit the accuracy and adequacy of the data. And part of the problem lies in a system of national accounting concepts and classifications which is poorly

fitted to the economic life and experience of the LDCs. But, taking note of the limitations, we assume that the basic data, while crude, are of the right order of magnitude for broad findings and inferences-- at least as plausible hypotheses, subject to test and revision as better data and study lead to an improved foundation.

The measures just cited, and widely used, are results of aggregation of: (i) populations, either within or among countries and regions, the products of whose economic activities are pooled together; (ii) the outputs of the several production sectors viewed as contributions to, and the different uses of product viewed as drafts upon, that common pool of product; (iii) the movements of total product, or its parts, in relation to population, over the shorter periods within the total time span for which we derive the average growth rates. Because the measures are comprehensive in their coverage of product, of the relevant populations within and among countries, and of the different segments of the time span, the resulting aggregates are effective summaries of the net result of a wide range of interrelated activities over a long span of historical time. But the synthesizing function of such aggregation may (a) involve sacrifice of important differences and variability; and (b) be attained along differing lines and with differing costs. These two aspects of aggregation and of the resulting measures are now briefly discussed, with particular reference to the economic growth of the LDCs since the early 1950s, and to the apparent puzzle set forth at the start of this section.

(a) Since the growth rate of say 2.6 percent per year in per capita GNP for 1960-72 (derived for some 67 LDC countries, each over a million population in 1972, and omitting major oil exporters, a few still in colonial status, and a few affected by current wars in Indochina) is an average, it may easily be the result of a combination of some countries with no growth and even a decline, with others having high growth rates. And, indeed, the World Bank Atlas, from which the average above was derived, lists LDCs with a total population close to 100 million, with a per capita growth of less than 0.5 percent per year, and some of them showing no rise or even decline (Bangladesh, Ghana, Afghanistan, Senegal, for example). At the other end, eleven LDCs with a population close to 120 million have growth rates of 3.5 percent per year or more, and their average (weighted by population) is 5.1 percent. Diversity of behavior within a comprehensive average is only to be expected; but this diversity in the growth records of the LDCs has some distinctive aspects, which will be considered after a brief comment on the implications of aggregation among sectors and over time.

Changes in per capita gross product are combinations of changes in per capita product of each of the n production sectors, appropriately weighted by the share of each sector in aggregate output. The important point to note in this connection is that the growth rate of the A sector (agriculture and related industries) has been markedly lower than that of the I sector (industry, including mining, manufacturing, utilities, construction, and transport and communication) and of the S sector (services, including trade, government, professional,

and personal services). Moreover, in relation to total population, i.e., on a per capita basis, the growth of a basic products sector like agriculture has been low. Thus, based on United Nations data for developing countries, for 1950-72, and calculated from quinquennial averages, the growth rate for per capita GDP over the twenty-two year period averaged 2.3 percent per year; but for the output of the A sector the average was only 0.56 percent per year.⁵ This finding of a low growth rate of agricultural output per head in the LDCs is corroborated by a recent study by the U. S. Department of Agriculture, which shows, for 1954-73, an annual rate of increase in per capita production of foods of 0.4 percent per year for the developing countries (compared with a rate of 1.5 percent for the developed countries).⁶

Short-term changes in subperiods of the time span for which the average growth rate is calculated do not necessarily cluster closely around the average. This is particularly true when total product comprises major sectors in which vagaries of weather from year to year may affect output (as in the case in so many LDCs), or when it is subject to short-term strains of changing markets and demand (as is the case in the smaller LDCs that rely heavily on export). Thus, even for a very large region, such as East and Southeast Asia, the indexes of GDP per capita, which rise over 1960-72, show a drop of stability from 1964 through 1966, and from 1971 to 1972 three out of the twelve annual changes, while in two others the change was a rise of only slightly over 1 percent. The record for Africa, excluding South Africa, shows two declines in per capita GDP, one no-change, and two rises of barely

1 percent (see YNAS 1973-III, Table 6b). For individual LDCs, sharp declines in aggregate product per capita and longer stagnation periods can easily be found within the twenty-two to twenty-five period spans.

Diversity in per capita growth rates among countries and population groups within countries, in the growth performance of different production sectors, and in the records for shorter subperiods within the total time span, could have been expected. However, some aspects of this diversity among the LDCs in the past quarter of a century are distinctive.

First, there is a clear suggestion that among the LDCs the combination of very low and even no growth at all in some cases with a high average per capita growth rate is a common occurrence. This diversity in growth performance is far more striking than among the DCs. Indeed, of the eighteen DCs listed in the World Bank Atlas (we excluded Puerto Rico), with a 1972 per capita GNP ranging from about \$2,000 (for Italy) to about \$5,600 (for the United States), not one shows a per capita growth rate for 1960-72 of less than 2 percent per year (the lowest was New Zealand, with 2.1 percent); and with the exception of Japan and Israel, both of which had rates well above 5 percent, the range was from 2.1 to 4.7 (the average for all DCs, for 1960-72, shown by United Nations, was 3.8 percent per year, see YNAS, 1973, III, Table 4b). In general, the world of the LDC market economies seems much more diverse than that of the DCs--in the range of per capita product from less than \$100 to over \$700, in the duration of their existence as independent, sovereign states, in size, and in what might

be called the distinctive long-term conditions that determined their historical heritage. The DCs, with their income range from about \$2 to less than \$6 thousand, with their common origin within the framework of European civilization (except for Japan), and with the common impress upon them of the social and economic effects of modernization and industrialization, exhibit far less diversity.

Indeed, one could argue that diversity among the LDCs widened in the post World War II period, if one can reasonably compare the situation with the earlier decades when most of the independent sovereign states of today in Africa and Asia were colonial possessions of Western powers. The multiplication of new sovereignties, in large numbers and at different dates, with varying degrees of preparedness and with diverse historical heritage that conditioned unity within and viability without of the new states of such different size and endowment, would in itself add to diversity in growth performance over the last two to three decades--setting aside the differences in purely economic factors. The difficulty that many of the new states faced in attaining lasting consensus and unity, and still do, needs no proof. It is evident in the incidence of civil conflicts and wars and the widespread imposition of a military dictatorship as a last recourse in stabilizing internal conditions to permit peace and some growth to occur. One could thus argue that the impressive rise in the average growth rate of per capita product among the LDCs, perhaps partly associated with the spread of political independence, has been accompanied by an almost inescapable widening of diversity in the growth rates among these countries. Since

the number of the units that have become independent sovereignties has increased tremendously, but at different times, during the last twenty-five years, it is not surprising that diversity in growth performance among periods has also grown. Stagnation or decline during some difficult political or other phase was followed by an accelerated growth, at historically phenomenal rates, during the next subperiod.

Second, the particularly low growth rate in per capita output of the agricultural sector, and the wide contrast between it and the growth rates of the I and S sectors, raise questions that are specially relevant to the LDCs. To begin with, such differences mean that the weighting of the sectors in arriving at the aggregate growth rate is important. If the price structure is such that the I and S prices relative to A prices are higher than in the world markets, the I-S weights are exaggerated and the aggregate growth rate is biased upward. A more critical factor is the susceptibility of the A sector to short-term fluctuations, to diversity of its short-term growth experience among regions of a large LDCs, since it is the major provider of the consumption needs of the populous low income strata within any LDC. Thus, a low growth rate of the per capita output of the A sector is associated with recurring declines or stagnation of the per capita supply of foods, in conditions in which such recurrent crises pose major organizational and political problems--and one need not go far to find examples in recent years. The possible concurrent growth of industrial output or the S sector at a high rate, total and per capita, is not an effective offset. It is only an indication of

the continuity in building the non-agricultural framework to higher levels, and would be fully warranted only if long-term recovery of the A sector or long-term prospects of adequate substitution for the domestic supply of the A-goods can be expected. Here again, the natural diversity in the conditions of the A sector augments the diversity of aggregate growth experience among the LDCs.

Third, as already suggested, initial per capita product of most populous LDCs was, and is, quite moderate. With the usual internal inequality in the distribution of income within the countries, per capita levels were low indeed for large population groups. Hence, inadequate growth or regression, discontinuities over time, are particularly costly in terms of human welfare--as they need not be in countries with relatively high per capita product and economic and social reserves for coping with short-term recessions or growth retardation. If diversity has been fairly wide among the LDCs, in growth rates over the full span, in variability of rates from subperiod to subperiod, particularly in the A sector, the combination of a high average growth rate for the all-embracing group of all LDCs with a flurry of crises and deprivation problems affecting now some, then other, members of the group, can be taken as "normal". The broader implications of such partial and temporary crises, particularly for policy choices and understanding of the immediate past and the proximate future, must be inferred from weighing of crises and deprivations against possible gains in the longer run. Such a calculus, admittedly difficult, is required if longer-term policy and prospects are not to be distorted by mis-interpretation of partial and temporary difficulties.

(b) Given diversity in growth rates of per capita product among the LDCs and their populations, or among sectors within a country, or variability of both sets of growth rates over subperiods, the proper choice of weights used for aggregation and averaging is important. The weights implicit in these summarization processes must, therefore, be examined for their effect on the averages of the type used above to initiate the discussion.⁷

If the levels of per capita product of the several population groups (within countries, or among countries or regions) differ at the start of the growth period, and if the growth rates of the per capitās also differ, the average growth rate for the aggregate will be much affected by the weights used. In the conventional calculations, of the type used by the United Nations, the sum of all products is related to the sum of all populations at the beginning and end of the growth period; and the average growth rate is calculated from the changes between the initial and terminal ratios (or along a straight line fitted to the annual ratios). In this procedure the average growth rate is affected by: (a) differences in the increase of populations with different levels of per capita product, so that if the population of richer LDCs grows relatively more than that of the poorer, the average growth rate in per capita product will be raised; (b) weights for the separate population groups, which are the size of population multiplied by per capita product, or total product. Neither implication of the procedure is defensible. Pooling among the LDCs, which would make the greater population growth of the richer countries meaningful to

the poorer, is non-existent. And there is no reason to assign greater weight to the per capita growth rate of a richer country than to that of a poorer. A more defensible procedure would be to hold constant the shares in total population of groups or countries with different initial product levels; and, particularly, to weight each country's or group's growth rate in per capita product by population, not by product. Indeed, for more plausible welfare connotations, one might argue that the growth rates in per capita product for the poorer countries should be weighted by their population raised by a multiple over 1.0, and for the richer countries, by their population lowered by a multiple less than 1.0.

The distinction between the conventional and the population-weighted averages of growth rates is of particular relevance to the experience of the LDCs in the last two to two and a half decades. During this period the richer of the LDCs (largely in Latin America) had the higher rate of population growth; and even more important, the richer LDCs showed higher growth rates in per capita product than the poorer LDCs, the latter largely in Asia and Sub-Saharan Africa. Consequently, the conventional procedure yields an average growth rate in per capita product for the LDCs as a group that is biased upward. With the structure of recent growth experience as noted above, the adjustment based on the use of constant population weights is sizeable. Thus, for the 67 LDCs covered in the World Bank Atlas for which we used growth rates of per capita GNP for 1960-72 (see discussion above), and for which per capita GNP ranged in 1960 (in 1972 prices) from about \$60 to about \$500, the conventional calculation yields an average growth rate of

2.62 percent per year. The use of the 1960 population weights yields an average growth rate in per capita product of 2.01--a reduction of close to a quarter. Similarly significant differences are shown in the paper cited in footnote 7.

If growth rates in per capita output of the various sectors differ, with that in the contribution of the A sector particularly low, the weights of the rapidly and slowly growing sectors obviously affects the combined product growth rate even for a single country; and we have already alluded to the possible adjustment for over-valuation of the industry and service sectors relative to that of the agriculture sector. But even more far-reaching questions arise concerning the character of some of the rapidly growing sectors -- questions that have been discussed for decades in the national income literature. If the share of government (among other services) has grown as it has in so many LDCs in recent decades, indicating a higher than average growth rate for that particular subsector, and if much of it was for development of administrative, defense, and similar maintenance functions, one could view these outputs as intermediate--as costs of operation, not as final product. With the resulting narrower and purer definition of national product, the growth rate of the aggregate--in which a rapidly growing subsector was now assigned a weight of zero--would presumably be reduced. And this is in fact the result if we limit national product to the outputs of the A and I sectors, and either omit the S sector completely or reduce its weight substantially as compared with its weight in conventional national

economic accounting (some illustrations are provided in the paper in footnote 7, in particular Section 4).

There is a related argument in connection with the variability of growth rates in total per capita product or important components, over short subperiods. The argument is that an average growth rate over two decades of say 2 percent per year means one thing when the annual changes within the period range from 1.7 to 2.3 percent per year, and another when declines in several of the annual intervals are offset by higher than average rates in other intervals. The difference, of course, lies in the special difficulties created by variability over time, particularly in the output of final goods required for "basic" needs, and by changes that are non-systematic and hence not easily foreseen. One could argue that in averaging annual changes over the span of two decades, the annual declines should be given greater weight and the high offsetting rates given lower weight than their mere arithmetic value--all of this compared with standard weights that would be attached to annual changes that are identical with, or close to, the simple average value over the full period. Use of such a weighting system would clearly reduce the averages for those LDCs for which the record shows a combination of annual declines or small rises in some intervals with explosively high rates in others--and these would be LDCs in which agriculture, sensitive to vagaries of weather, is of great weight, or the large number of those which, during the period since World War II, had major difficulties in establishing a peaceful and viable national state.

Even this brief note on the effects of diversity and variability on aggregation and averaging for the LDCs suggests a Pandora's box of difficult and question-provoking adjustments. It is impossible here, and would be difficult elsewhere, to approximate and test the magnitudes of the warranted modifications. The illustrative calculations in the paper mentioned above, which did not touch on effects of the variability of growth rates over time, reduced substantially the aggregate average growth rate for per capita product of the LDCs (limited to East and Southeast Asia and Latin America). For the period 1954-58 to 1964-68, the conventional rate of some 2.0 percent per year dropped to between 1.1 and 1.4 percent (see Table 9 of the paper cited in footnote 7). And the effect is all the greater, because for the DCs the application of some of these adjustments raised rather than lowered the average growth rate in per capita product.

With no way of advancing the subject further, one may conclude with three general observations. First, the diversity and variability in the growth patterns of the LDCs, or within the individual countries, are an important datum in judging the significance of the averages for the LDCs as a whole, both for translating the current changes into long-term trends and for any general hypotheses about factors affecting the economic growth of the LDCs. Second, the conventional aggregates and averages tend to exaggerate, to bias upward the composite measures for the LDCs--which they do not do for the DCs--the main reason being that, at least over the last two decades, the poorer LDCs showed lower growth rates in per capita product and more vulnerability to variability over

time than the richer LDCs, an association not found among the DCs. Third, the completely adjusted purified growth rates in per capita product among the LDCs may prove to be higher than that which prevailed among them in the past--and perhaps not inferior to similarly adjusted pre-World War II long-term rates among the current DCs. But this last suggestion is only a plausible guess, and would require testing after the implicit conceptual questions have been resolved.

3. Population Growth and Institutional Innovations

The growth of per capita product among the LDCs was attained in decades marked by a high rate of population increase. According to the annual indexes of total and per capita GDP, available from the United Nations for 1950-72, for the LDCs as a group (conventional procedure) the growth rate for the 22 years was 2.53 per year; that of population--2.43 per year; and that of total product--5.03 per year.⁸ For the DCs the same series show a growth rate of per capita product of 3.29 percent per year, of population only 1.09 percent per year, of total gross domestic product 4.42 percent per year--or almost a third higher, or less than a half, or about a tenth lower, respectively than those for the LDCs.

It thus appears that failure of the growth rate, conventional or adjusted, in per capita product of the LDCs to keep up with, let alone move toward, that of the DCs lies in the much higher rate of population growth in the former. And one can easily calculate that with the same growth rate of total product, but much more moderate rate of population increase of say 1 percent per year, the rate of increase in

per capita product for the LDCs would climb to almost 4 percent per year. Or, as has often been said, population growth has been eating up the fruits of the growth of product, leaving a small residual for the rise in per capita income.

Whatever our judgment of the threatening implications of population increase in the LDCs for the longer-term future, the suggestion that the high rate of population growth is an explanatory determinant of the moderate growth in per capita income is both easy and misleading. In and of itself, the rate of population increase is an inadequate explanation of either the success or failure of growth measured on a per capita level. In this connection the population growth variable is significant largely in that it reflects the institutional and social conditions of a country.

To begin with, the higher rate of population growth of the LDCs than of the DCs is a recent phenomenon: for decades before the 1930s, and back to the early nineteenth century, the rate of the former was markedly below that of the latter.⁹ To be sure, this was due to a much higher death rate in the less developed regions, which kept the rate of natural increase down despite fairly high crude birth rates--an extremely inefficient method of population control, and one that could not contribute to social and economic productivity. But it is important to recognize that only in the 1930s, and especially after World War II, the LDCs began to show significantly higher population growth rates than the DCs; and that while some birth rates did rise, the trend was due largely to a rapid reduction of death and morbidity

rates--one of the first requirements of, and a most important and valuable ingredient in, modern economic growth.

Second, if population, viewed as a collective of consumers, grew more rapidly in the LDCs, and thus can be debited with a greater proportionate draft upon the fruits of economic growth, it also grew more rapidly as a collective of potential workers and should be credited with a greater contribution to total product. The source in footnote 9 shows that for a less developed group of regions (Africa, Latin America, and South Asia), whose total population grew from 1.08 billion in 1950 to about 1.75 billion in 1970, or at an annual rate of 2.43 percent, population aged 15-64 and thus classifiable as the potential labor force grew from 602 to 940 million, or at a rate of 2.24 percent per year. In the developed regions, including North America, Australia-New Zealand, Japan and Europe, excluding Eastern Europe, total population grew from 563 to 701 million, or at an annual rate of 1.1 percent and so did the population aged 15-64, rising from 361 to 449 million (see Tables 2 and 8, pp 7 and 18 of the source). Thus the rate of growth of population of working age in the LDCs was more than twice that in the DCs; and one may ask why these additional workers could not have contributed at least to about the same proportional rise in product per capita in the two groups of countries.

Third, while in comparing LDCs and DCs as groups, we find that a higher rate of population increase in the former is associated with a lower growth rate of per capita product, at least for the past two to two and a half decades, this association does not hold for

the individual countries within the LDC group. Using the 67 LDCs, with their records for 1960-72 found in the World Bank Atlas, we classified them by their rates of population increase over these twelve years, which averaged 2.5 percent per year (weighted by 1960 population). For twenty-nine, not counting India, the growth rate of population was 2.5 percent or less. Their population was 356 million in 1960, and their population-weighted average growth rate in per capita income was 2.1 percent per year. India, with a 1960 population of 432 million, had a growth rate of population of 2.3 percent per year and of per capita product of 1.1 percent. In the remaining 37 countries, with a 1960 population of 413 million, the growth rate of population was more than 2.5 percent per year, and the population-weighted growth rate of per capita product was 2.9 percent per year. Thus, the association among the LDCs between the rate of population increase and the growth rate in per capita product was, if anything, positive rather than negative--reflecting in large part the difference in growth rates between Latin America and the other LDC regions. It would not be difficult to suggest specific explanations, but the finding is cited merely to indicate that over recent decades other factors tended to outweigh the high rates of population growth, at least among the LDCs.

Fourth, the acceleration in the rate of population increase in the LDCs has been marked because the rate of decline in the death rates was extremely high--about five times as fast in the two to three decades as the decline of mortality rates among the DCs in their population-transition phase. And since the decline in birth rates

has lagged behind that of death rates in the past experience of the currently developed countries, it is assumed that the lag in the case of the LDCs is only to be expected. But historical analogies may be misleading; and unless there is a tested explanation and an indication of the operative mechanism, references to lags are just descriptions of still to be explained events. This comment is particularly relevant because in many LDCs in Latin America long-term declines in death rates have been accompanying long-term rises in per capita product, and yet there has been no indication of a responsive fall in crude (or age-of-women standardized) birth rates.¹⁰ One would expect that thirty to forty years of substantial decline in mortality, including that in infant and children's mortality, would lead to some contraction of birth rates, assuming that the high level of the latter in the past may have served in part to offset the deaths of infants and young children. The persistence of high birth rates, therefore, calls for an explanation.

Some tentative hypotheses to try to account for the persistence (and components) of high levels of fertility in the LDCs in recent decades have been presented elsewhere.¹¹ But they should be summarized here, if only because they interpret the patterns of demographic behavior as reflection of economic and institutional conditions that have a major bearing on economic growth in the LDCs.

The relevant hypotheses were noted under three broad heads: technology of birth control; possibly lower costs of bearing and rearing children in the LDCs; possibly higher returns from larger numbers of children in the LDCs. The technology of birth control was viewed as

affecting some segment of the population of the LDCs, the group that wishes to have fewer children. However, even for this group, a variety of birth control methods, which, in the long-term past, had led to control of population numbers (e.g., postponing the age of marriages of females) were still available. Since the groups did not have to depend on the modern means, the significance of the technology factor is reduced. Nor is it clear that the desire for fewer children affects a substantial proportion of the population of the LDCs in their child-bearing ages. The lower absolute costs of children in the LDCs are clearly recognized; but one may question whether these costs, relative to the economic level of the parental population, are so low, compared with their costs in the nuclear families of the developed countries. Furthermore, costs cannot be effectively discussed without consideration of returns, and it seemed warranted to place the burden of explanation on the returns from children. The implication then is that in the LDCs, families, in their own responses, and possibly reflecting the norms of blood-related collectives and societies wider than the family, view children as an investment, as a source of wealth, defined broadly as economic and social power--in the conditions, determined by economic and social institutions, within which they live.

Two aspects of this investment in children are spelled out in quotations from the paper cited in footnote 11. "One is the economic, labor pool aspect, the desire for more children because under the rural or small family business conditions of the LDCs, children are a supply of labor at the disposal of the family that, after some years,

provides economic savings and advance far greater than any that could be generated by the same family unit with fewer offspring." The second aspect of investment in children may be designated the genetic pool aspect, relevant to those societies among the LDCs in which economic and social mobility is blocked by monopolization of economic and social power by a few families. Hence limiting the number of children and giving them greater training or education is no assurance of future economic or social rise. "Under such conditions, advance for the offspring of the lowly is a matter of success based on personal characteristics or endowments, on a kind of genetic lottery that may turn up a dictatorial corporal or general, or a successful athlete, or the female consorts of either, so prevalent in many LDCs." Here a rational calculation would call for as many children as will survive to maturity, as many more tickets in the genetic lottery.

The third, and perhaps most far reaching, aspect of the investment in children is that of security--not merely or primarily the economic security of parents who, in their old age, have to rely on the help of surviving children, but much broader, encompassing protection against natural and social calamities, protection not provided by the government or other, not blood-related organs of society. The pressure in many pre-industrial societies (e.g. for centuries in China) for larger families and a wider blood-tie group has been associated with the weakness of the government, and the need to rely on family ties for security of the individual members. So long as governmental and other non-blood-related organizations remain weak in this respect, an adequate

increase of those related by protective blood-ties will be a high priority goal, despite possible short-term disadvantages.

Two aspects of these tentative hypotheses advanced to explain the high fertility levels in the LDCs, and thus their high rates of population growth, should be noted. One is that emphasis on returns from children as the main factor is corroborated by the structural characteristics of the high fertility rates in the LDCs, to which the main burden of the paper just cited is devoted: the entry of females into marriage at early ages; the continuation of childbearing to much more advanced ages of married women than in the DCs; the importance of high parity births; and the high proportion of children born to aged mothers and particularly to aged fathers (beyond 40 years of age)-- despite the presence of a number of surviving siblings. All this seems to suggest, although it does not prove, that the production of large numbers of children is a systematic and planned activity, rather than a reflection of impetuous and uncurbed passion or of blind adherence to some traditional and increasingly irrational pattern.

The second, and more important, aspect of the hypotheses, is the emphasis on fertility rates as rational responses of the population to the economic and social conditions, implying that major declines in fertility are not likely until these conditions are changed.¹² The emphasis is then on economic and social structure, and the key factor suggested as setting limits to the economic growth of the LDCs is then the capacity of the societies for the kind of institutional innovation, for changing the existing economic and social institutions so as to take

advantage of the potentials of modern, i.e., more advanced technology. In their specific form, these potentials would differ from country to country depending on the historically conditioned endowments and the changing stock of available technology.

This implication is of particular relevance in the present connection. It may be amplified by suggesting that just as population growth cannot be treated as an exogenous variable determining growth rates in per capita product but must be viewed as the result of human decisions in roughly rational response to economic and social conditions, neither can we assume that there are some rigid technological constraints on the growth of the LDCs that would explain their limited achievements in the way of increased per capita product in the recent past. In particular, one must resist the tempting argument that because these LDCs are poor, they cannot generate sufficient savings to finance the capital formation necessary for higher growth rates. The proportional magnitude of material capital required for growth rates higher than those achieved would not be large even in economies with relatively low product

per capital-if a backlog exists in technological opportunities, and effective utilization of productive factors is assumed. With flexibility of factor proportions, facilitated by choices in the rate of utilization of both capital and labor, relatively low capital-output ratios can be attained. Of course, an abundance of capital can be used in a trade-off for greater inefficiency; but this possibility does not justify the view that capital shortages are a key factor in limiting growth rates in the LDCs. That view is widely prevalent, despite the experience of not a few LDCs that managed to reach high levels of growth in per capita product with high rates of population growth and with adequate domestic savings proportions, low average incomes notwithstanding; and despite similar experiences in the past of a number of current DCs.

One must look then for the key factor in the capacity of LDCs to adjust their economic and institutional structure in order to provide optimal, or at least adequate, channels for growth. Such adjustments may easily be constrained for non-economic reasons, for example by resistance to the abandonment of wasteful practices that have assumed quasi-religious significance, and represent no special interest of any group. Or it may be that institutional changes affect adversely some groups while benefiting others, and the consensus for such changes is absent. Or it is possible that a higher rate of economic growth, with its disruptive (as well as productivity-raising) effects would, if forced, upset the basic consensus and threaten the unity of the country, causing unavoidable delays in economic advance.

For this reference to innovations in economic and social

institutions, and to the difficulties of sustaining them, to be more than a shift of focus to a rather vague concept of "capacity for modernization," calls for careful examination of individual LDCs. By this approach, those countries that have delayed the adjustment, that have adopted limited growth-promoting policies, that have not removed the obstacles to an effective program, and those that have suffered breakdowns, can be compared with others of apparent success, and their specific antecedents to that success. Such an attempt would have to rely on the rapidly growing literature on the LDCs, whose diversity was emphasized earlier; and is certainly beyond the scope of a brief summary. One may still argue that, barring conditions of political subjection, a sovereign less developed economy, seen as a unit in a diversified world and with many technological opportunities, cannot properly be viewed as having the limits on its growth set within reasonable magnitudes, by factors exogenous to its economic and social conditions--i.e. either in its genes, or in its demography, or in some aspect of technology (with possible exception of Eskimos in the Arctic wilderness, or nomads in the desert). And one can cite evidence from both recent and past history on the difficulties that the currently developed countries in the 19th century past had in organizing themselves for modern economic growth--establishing a unified state that could channel such growth effectively. If one thinks of the rapid succession of internal conflicts in the two recent decades--in Pakistan, in Nigeria, in the Congo, in Ethiopia; the rapid changes in political regimes, frequently ending in military dictatorships or one-party government, in

many LDCs, including those in Latin America, which have been politically sovereign for many years--one can see that setting and maintaining the basic conditions for economic growth is a demanding and never-ending task. The solutions of this task can vary greatly in terms of adherence to or sacrifice of principles highly prized by many societies (individual liberty, equality, or cooperation in loss and gain). It is the difficulty of easing this task that must be identified, in the first instance, as the proximate cause of the shortfalls in growth among the LDCs, shortfall that may be viewed as avoidable.

The difficulty is exacerbated by two consequences of the low per capita product of the populous LDCs. One, already noted, is vulnerability to short-term calamities--due to dependence upon less advanced agriculture, and greater difficulties in coping with natural disasters (earthquakes, floods, etc)--because of lack of reserves that could be utilized to deal with crop failures and other disasters, and weakness of transport and other means of mobilization. The other consequence that deserves mention is the technological distance between the low-income and even middle-income LDCs and the developed countries from which they could borrow technology and secure assistance. The technological distance means that while, in general, there is a substantial backlog of accumulated technology that has not been exploited in the past by LDCs, the current supply of technology and technological opportunities available in the DCs may be of little value to the LDCs. They, to illustrate, may need better small-scale transport or economical water pumps rather than complex computers, nuclear installations, or

supersonic airplanes. The flexibility of choice of capital and labor apparently open to the LDCs may thus be limited by the non-availability of a better technology that would suit their particular needs, and the scarcity of technical talent to generate the adaptive uses of whatever can be effectively borrowed from the DCs.

These two consequences provide a partial explanation of the finding that the poorer LDCs in Asia and Sub-Saharan Africa, with their low per capita incomes, showed a lower growth rate of both total and per capita product than the richer LDCs, particularly in Latin America (excluding the oil rich units from all groups). It is only a partial explanation, because so many LDCs in the Asian and African regions have only recently attained their political independence. Many of these faced particular difficulties in establishing a unified, and viable, new political entity, with an incidence of civil conflicts and political breakdowns; and in some of them the resulting constraints upon economic performance and growth have continued. But even allowing for these major struggles in initial national formation, it may still be true that the greater vulnerability of the lower income LDCs and their greater technological distance from the DCs contributed to a lower growth rate in recent decades than that of these LDCs, whose higher initial per capita product and a greater extent of industrialization reduced their vulnerability to short-term calamities and made adoption of modern technology easier.

4. Evaluation of, and Response to, Economic Growth

Assume that, with the adjustments suggested in Section 2, the growth rate in per capita product of the LDCs over the last quarter

century averages between 1 and 1.5 percent per year, which means a total rise over the period of between 28 and 45 percent. Consider also that an increase in real return per head is indicated by such evidence as the marked reduction in death rates over the period by between a quarter and a half; rising per capita consumption; and higher levels of education and health. Has an evaluation of, and response to, this, undeniable, economic advance of the LDCs, and for most of them after a long period of stagnation, been affected by changed expectations? And if so, why and how did expectations change?

In observing evaluation of economic growth in the DCs, three characteristics can be suggested, at least as related to modern economic growth. First, growth appears larger in prospect than in retrospect: quantity indexes weighted by beginning-of-period prices yield appreciably higher rates than the same indexes weighted by end-of-period prices. This difference is due to the fact that new, innovation-related products are priced much more highly in the earlier years --before their wide spread and rapid growth, and the associated improvement in efficiency and reduction in costs--than in later years when these products become cheaper quasi-necessities. Second, all innovation-powered economic growth eventually generates problems of adjustment and undesirable externalities--many unforeseeable in the early stages, because of inadequate knowledge of the properties of the technological innovation and of the social innovation that it may bring into being. This is an almost inevitable result of some "new" elements in an innovation, which by definition is a venture into the partly unknown. Third,

since current events are always much more heavily weighted than past, the evaluation of economic growth tends to be biased downward, in the deflation of the initially high values of the positive contribution of innovations and in the concentration on the current problems generated by them. The beneficiaries of electric power or of the internal combustion engine, for example, tend to take them for granted, while justifiably complaining of either pollution or failure of centralized sources of energy affecting millions of people. They forget the older days of confinement in equally or more polluted cities without a chance to escape to the suburbs, or of dependence on sources of light and energy far less efficient than centrally provided electric power. Similarly, in the field of health, the beneficiaries of reduced mortality in the younger ages are concerned over the degenerative diseases of older people, and over the prolongation of life to ages when it can be neither pleasant nor productive.

If tempered by consideration of the longer-term contribution of past economic growth, such emphasis on current problems, such an implicit downward bias, may be justified. It is a necessary stimulus for overcoming the problems, or at least mitigating their effects. But the important point is the relevance of these observations to the view held by the LDCs of their economic attainments and growth in relation to their distance from the DCs. For with respect to the latter the LDCs are, in a way, like earlier versions of the DCs, the earlier generations of the latter who appraise growth in prospect rather than in retrospect, and the price weights of the LDCs are an analogue of the beginning-of-period

prices used in weighting the quantity indexes. This analogy is confirmed by the recent study of comparative purchasing power on an international scale cited in footnote 2. To illustrate, when we compare consumption per capita in India and the United States, using Indian price weights, the ratio of quantities (India to US) is 1 to 22.2; whereas when we use the US price weights, the ratio is 1 to 12.0 (see source, Table 13.5, p. 174). Similar results can be found for the US-Colombia and US-Kenya binary comparisons. In other words, the LDCs, using their own standard to evaluate the levels of the DCs appraise them more highly and find the distance to them greater than would the DCs, using their standard and appraising the distance to the LDCs. Likewise, one could suggest that not having fully experienced modern economic growth, the LDCs are much less aware of (or concerned about) some of the maladjustments and negative externalities that it brings in its wake. Thus, the LDCs would evaluate growth much more highly than the DCs. Furthermore, if in their evaluation of their own growth at least a part of the yardstick is formed by the attainments of the DCs, the distance to be at least partially reduced and the gap to be closed loom wide indeed.

We come now to the question as to the bases of evaluation of economic growth in the LDCs, evaluation within those countries as to the adequacy or shortfall of the growth attained. As already indicated, we deal here with intangibles, not susceptible of quantification or hard evidence (at least not at hand). Yet the judgment involved is an important factor in the response to economic growth that has already occurred, possibly inducing change-provoking action if growth is found to be

significantly short of the minimum goals. In concluding this paper, it would be tempting to speculate on the yardstick, the expectations, that may be applied, and on the changes in such expectations that may have occurred in recent decades. But even such speculation involves review of various goals--some competing, some complementary (greater output, more equity, minimum assurance of defense power in the divided and hostile world, adequate individual freedom, and so on); and this is beyond my scope and competence.

Instead, one may point out some aspects of the evaluation and possible response that are apparent from the discussion. First, if in evaluating economic growth, the emphasis is not so much on the rise that may have been attained but on the distance to some minimum goal, the judgment will depend on the distance between the goal and the initial economic position of the country; as well as on the tolerance of interruptions and delays. To illustrate: if a country begins with a per capita product of \$100, and has also previously suffered from short-term failures, the goal of growth may be set at \$500 as a desirable level that would also act as protection from short-term disasters or, at least, minimize their impact. If then it is assumed that a fair target is to reach this level in fifty years (or thereabouts), an average growth rate in per capita product of about 3.3 percent per year is expected. If, over a twenty-five year period, growth has, in fact, raised per capita product by 50 percent, the movement was only an eighth of that necessary to cover the total distance--even with the target remaining fixed (and it is likely to move upward over time). For such a calculation the comparison

of the actual growth rates in the LDCs, either with those in their own past or those in the past records of the DCs, is not relevant. In the past of these LDCs, particularly those that were not free to plan their own destinies, such economic goals were overshadowed by the goal of political freedom and independence. And in the past history of the current DCs, even of the follower countries, initial levels were much higher (except perhaps for Japan) and the distance between these levels and the goals set was narrower--so that the growth rates viewed as feasible and acceptable might have been distinctly below those that the recent post-World War II growth experience warranted.

Second, the same applies to distributive aspects of growth, to effects on inequality in the distribution of returns--which we did not touch upon partly for lack of space, but largely for lack of reliable data--despite prolific discussion in the recent literature. If the goal is to avoid, with given aggregate growth, deterioration of economic position of large, lower income groups, the requirement of some significant advance applies not only to the country as a whole, but to sub-groups of the population. The failure of crops affecting farmers, or unemployment and underemployment affecting large proportions of the labor force augmented by rapid population growth, represent shortfalls--even if the over-all advance of the country may have been impressive by past standards.

Third, it may be realistically argued that the expectations, the yardsticks by which economic growth is evaluated, have changed in recent years. Goals are more ambitious and delays are less well

tolerated than probably was the case in the pre-World War II past. The increased technological power of man, and the rapidity with which devastated countries recovered and forged ahead after World War II, the success in reducing and wiping out disease and ill-health the world over, and the high rates of economic growth achieved by so many countries, had an effect similar to that ushered in by modern economic growth when it emerged in the pioneer and early follower countries in the late eighteenth and the first half of the nineteenth century. The effect was to strengthen the view of man as the creator of his destiny, of the vast potential power of man's advancing knowledge in providing economic abundance, once the needed adjustments of social structure were made; and in the widening ties of communication in the world, to spread the view to countries that had previously failed to exploit adequately the potentials of modern technology. These two strains--of the dominant power and potential of modern technology (and of the stock of useful knowledge behind it) and its accessibility to any human society willing (and presumably capable) to make the needed adjustments in social and economic structure to channel this power properly--have certainly been strengthened and spread more widely in the world in the post World-War II decades both, by a denser network of communication and by examples of extraordinarily high economic performance bordering on miracles.

Fourth, the spread of political independence to so many national units in the world, which proceeded at such a phenomenally rapid rate after World War II, and is still continuing, created that

many more foci of responsibility for economic growth. It proceeded on the tacit assumption, sometimes overt in the propaganda literature for political freedom, that the new sovereign powers would be capable of adequate response to the challenge of economic growth--or would, at least, be more responsive than when they were colonies. In that sense, adequate economic growth was viewed as a promise, as a first priority task, by those many and populous LDCs that attained sovereignty only after World War II; as it has become for all states, with the recognition that it is the social response--not natural resource, not genetic endowments, not even the existing stock of material capital--that is crucial. In the case of the poorer LDCs, the challenge was, of course, much more acute, because they lacked reserves for ameliorating the effects of short-term relapses and of temporary stagnation.

Fifth, the multiplication of sovereign units represented, and naturally contributed to, the strengthening of nationalist tendencies and positions in the world--if only as a matter of establishing more firmly the new identities and developing a consensus on the basis of a feeling of common belonging. But this was also a divisive tendency; and in the newly established national units there has often been room for strife within (among divergent, ethnic, tribal or religious groups), and for conflict without. Economic growth was, consequently, sought to provide not only adequate economic returns to the population but also the sinews of strength in establishing viable unity within the country and in assuring an adequate defensive posture vis-a-vis the

outside. The intensification of industrialization in many LDCs, particularly the larger ones, sometimes to the neglect of agriculture, was clearly motivated by the need for some minimum domestic supply of tools that, however useful in peace, were indispensable in case of armed conflict. And this made judgment of adequacy of economic growth dependent not merely on progress towards peaceful goals, but on its provision of the minimum power for self-protection in a divided and hostile world.

These brief comments, which could be elaborated by numerous illustrations taken from the record of events in the last few years, are sufficient to indicate that the evaluation of economic growth attainments in the LDCs, by the people involved (in so far as one can judge from the outside), may be in terms of high expectations, of yardsticks that involve fairly ambitious goals. It is the application of such yardsticks that may explain the tension and strain, the search for modifications of national and international structures. This would be only a natural response to the judgment of inadequacy of the growth attained so far, and given the dominant theory that potentials of modern technology and modern economic growth are accessible and available once the necessary modifications of economic and social structure, at home and abroad, are made.

Such a response is not without danger. If economic growth problems of the LDCs can effectively be met only by changes in internal social and economic structure, and possibly even require changes in the international framework that channels relations between the LDCs

and the rest of the world, it is also true that each change or modification has its specific cost--short-term for the groups that are affected adversely, and long-term for the whole society. And no calculus is available for measuring the balance of costs and gains, short-and long-term, in order to provide guidance in seeking to maximize returns for the society or societies involved.

The difficulty is that economic analysis of economic growth, in terms of inputs and outputs, both the conventional and the more expanded (including inputs into human capital, valuation of leisure, etc.), is still too limited to encompass the costs and returns from modifying the economic institutions, let alone the social. How do we value the cost of shifting from the status of independent worker to that of employee --even if we can estimate the difference in average income? How do we measure the costs of displacement of rural population from the land and of the migration to the cities for a long period of acclimatization and adjustment to urban life? Or in the case of more violent modifications of social structures, how do we compare the costs of forceful re-education campaigns (including concentration camps) with the additions of a fraction of a growth rate in GNP, or in the product of heavy industry? The questions are not irrelevant, for these various alternatives have in fact been followed, with differing results in terms of conventional economic product, yet they obviously represent situations in which even the expanded economic calculation yields only a narrowly partial answer. And emphasizing such analyses, as something we can do, in the hope that they will shed some light on some aspects of the problems, may mean a dangerous

neglect of unmeasured major factors. We would, thereby, provide badly biased answers, for situations in which the total costs are markedly different from those measured.

Since the widespread and far-reaching change in economic and social structures is a condition, part and parcel of modern economic growth, economic analysis of growth in its present state is severely limited. However, this is no argument either for neglecting the need, in a variety of situations, for such economic and social changes; or for not pushing the study of economic growth toward a broader approach in which the application of quantitative analysis and direct consideration of the changes, past and present, in the institutional framework could be combined. Even if the combined measurement of economic costs and costs of social change may prove impossible, the very identification of changing aspects of social and economic institutions should be helpful, both in refining the narrower economic analysis and in widening its use for aspects of economic growth neglected until now.

Footnotes

¹The figure, for "centrally planned economies" is from the World Bank Atlas: Population, Per Capita Product, and Growth Rates, (Washington, 1974), p. 8

²These estimates of per capita GNP in US dollars are based on modified or unadjusted exchange rates, and tend to exaggerate the contrast--compared with the results of detailed adjustments of local currency estimates for purchasing power parity. Yet one should not assume that such far reaching adjustments reduce the gap to a narrow range. A recent elaborate study yields some illuminating results (see Irving B. Kravis, Zoltan Kennessey, Alan Heston, and Robert Summers, A System of International Comparisons of Gross Products and Purchasing Power, published for the World Bank by The Johns Hopkins University Press, Baltimore, 1975). In a comparison of India and the United States, to take an extreme example, the conversion by exchange rates yields a ratio of per capita GDP of 2.04 to 100 (for 1970); that using per capita quantity indexes based on international prices, yields a ratio of 7.12 to 100 (see Table 1.3, p. 8). This is the largest proportional adjustment of the ratios ($3.5 = 7.12/2.04$). Similar results for Kenya and Colombia are 1.9 and 2.3 respectively. If we assume a proportional adjustment of about 2.5 for all low income LDCs relatively to all DCs, the ratio indicated in the World Bank Atlas (\$110 to \$3,670, or 0.029) would rise to 0.072 and the range between the per capita product of the two groups

of countries would still be 1 to 14. A range of this extent surely warrants consideration of the implications of the low per capita product of the LDCs for the vulnerability of their economies to short-term crises, and for the meaning of even relatively high rates of growth in their per capita product.

³The estimates for 1950-1960 are from United Nations, Yearbook of National Accounts Statistics, 1969, Vol. II, International Tables, (New York, 1970), Table 4b; those for 1960-72 are from United Nations, Yearbook of National Accounts Statistics, Vol. III, International Tables, (New York, 1975), Table 4b. These volumes are referred to briefly as YNAS, 1969, II; and YNAS 1973, III.

⁴See Simon Kuznets, Economic Growth of Nations, Harvard University Press, (Cambridge, 1971), Table 1, pp. 11-19.

⁵The underlying annual indexes of gross domestic product at constant factor costs, total and per capita, and of output in the several sectors, particularly the A sector, are from Table 6b of YNAS 1969, II and YNAS 1973, III. The earlier volume is used to compute quinquennial arithmetic means of the indexes for 1950-54, 1955-59, and 1960-64, from which the growth rates for the first two quinquennial spans are derived. The later volume is used for 1960-64, 1965-69, and 1970-72, from which the growth rates for the quinquennium 1960-1964 to 1965-69, and the four year period from mid-1965-69 to mid 1970-72 are derived. The averages cited are the geometric means of the growth

rates for the four intervals, with due regard to the shortness of the last interval.

⁶See United States Department of Agriculture, Foreign Agricultural Economic Report, no. 98, The World Food Situation and Prospects to 1985, Washington, Dec. 1974), p. 12. The classification into the developing and developed groups is similar to that of the United Nations, but nonmarket economies are included.

⁷Several of the points raised here have been discussed in greater detail in my paper, "Problems in Comparing Recent Growth Rates for Developed and Less-Developed Countries," Economic Development and Cultural Change, vol. 20, no. 2, January 1972, pp. 185-209, reprinted in Simon Kuznets, Population, Capital, and Growth: Selected Essays, W. W. Norton (New York, 1973), pp. 311-342.

⁸For the sources and procedure in calculating the growth rates see footnote 5.

⁹For a convenient summary of the long-term population growth estimates see United Nations, Background Paper for the Bucharest World Population Conference, Demographic Trends in the World and its Major Regions, 1950-1970 E/Conf. 60/CBP/14 (April 1974, mimeographed), Table 1, p. 5. The table shows world population estimates by John Durand back to 1750, linking after 1900 with those of the United Nations.

Footnote 9 (continued)

Although non-market economies are included, and the distinction between less and more developed regions differs slightly from those used above, the results would not be changed even with adjustment to our classification, and exclusion of Communist countries.

¹⁰A valuable collection of long-term series is found in O. Andrew Collver, Birth Rates in Latin America: New Estimates of Historical Trends and Fluctuations, Institute of International Studies, University of California, Research Series no. 7 (Berkeley 1965). Two monographs by Eduardo Arriaga, in the same research series, provide valuable data and discussion on death rates and their declines. They are: New Life Tables for Latin American Populations in the Nineteenth and Twentieth Centuries, Research Series no. 3 (Berkeley, 1968); and Mortality Decline and Its Demographic Effects in Latin America, Research Series no. 6 (Berkeley, 1970).

¹¹See my paper, "Fertility Differentials between Less Developed and Developed Regions," to be published in Proceedings of American Philosophical Society in late 1975.

¹²Lest it be thought that continuation, for some time, of high rates of population growth prove impossible because of physical or technological limits, it should be noted that the United Nations population projections do envisage such trends for the remainder of

Footnote 12 (continued)

this century. Yet these projections of population volumes are considered sustainable--barring, of course, catastrophes of the nuclear holocaust type--with declining death rates. The brief explanations of the assumptions in the two sources cited below clearly indicate the implications, and the key roles particularly of those relating to the modernization of the economic and social structures.

The magnitudes projected should be noted--using the "medium" (of several) variants that can be viewed as more plausible than the others. In World Population Prospects as Assessed in 1968 (New York, 1973), the population of less developed regions (defined again to include South Asia, Africa and Latin America), which grew at the rate of 2.8 percent per year in 1965-70, would keep growing at roughly the same rate to 1985, and then the rate would gradually decline to 2.2 percent by the end of the century. For the developed regions (defined to include Europe, excluding Eastern Europe; North America; Japan; and Australia-New Zealand), the growth rate for 1965-70 of close to 1 percent would remain at that level to 1985, and then decline to 0.8 percent by the end of the century. The stability, at high levels, of the growth rate for the LDCs through 1985, is the result of a decline in birth rates offset by an almost equal decline in crude death rates (e.g. for South Asia a decline in birth rates from 44 per thousand in 1965-70 to 37 per thousand in 1980-85, almost matched by a decline in death rates from 17 to 11 per thousand for the same two quinquennia, ibid. Table A.3.1, p. 68), with the further decline in birth rates outweighing the

Footnote 12 (continued)

diminishing decline in death rates. For the DCs, the movements of crude birth and death rates are much **slighter**, as is the change in the absolute level of the low rate of population increase.

In World Population Prospects, 1970-2000, as Assessed in 1973, working paper, mimeographed, ESA/P/WP/.53 (New York, March 1975), the 1970 population totals have been revised slightly downward, and so have been the projected growth rates (due largely to unexpectedly sharp declines in fertility in the DCs, and failure of death rates to decline as rapidly as projected earlier). However, the general patterns of persistence of high growth rates in the LDCs through 1985, and only moderate declines thereafter, and the contrast between these levels and those for the DCs (at about half to a third of those for the LDCs) remain (see e.g., Table 1.1, p. 12).

This brief summary of UN population projections indicates that, even with substantial advance in modernization, a realistic prognosis suggests continuation of high rates of population growth in the LDCs, peaking in the decade 1975-85 but remaining at fairly high levels to the end of the century, and exceeding the population growth rates in the DCs by wide margins. The possible consequence for the difference in growth rates of per capita product between the LDCs and the DCs, and the possible persistence and widening of the gap, is clear.