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United States Congress

## *Growth Prospects for the American Economy*

**D**URING the 1940's and 1950's the use of long-range projections of the growth possibilities of the American economy became standard practice in many areas of public and private decision making. Its use has become commonplace in the areas of agricultural policy, water resource development — both power and irrigation, planning of large public works programs, forestry policies and various other public programs — federal, state, and local, which must be planned in the light of prospective conditions extending over long future periods. In the private sectors of the economy the use of long-range projections as a guide to capital investment has grown in importance and has extended into new areas including research and development and personnel planning. The use of long-range projections in connection with the debate over postwar economic policies during the 1940's led to a more widespread knowledge of this tool, and was the largest single stimulus to the expansion in its use.<sup>1</sup>

Such projections are of a calm, routine character compared to the controversies of the 1950's and earlier. While the scientific basis for the making of long-range projections has progressed a long way since the 1920's, there still remains much cause for caution in their construction and use.

We cannot be too careful in making sure that any projection which is prepared as a basis for private and public policy decisions is designed so as to provide the sort of evaluations of

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<sup>1</sup> The expansion in the use of long-range full employment projections has been strongly influenced by the persistent and outstanding work in this field by the National Planning Association. Beginning with "National budgets for full employment" in 1945, their series continued in 1952 with "The American economy in 1960," by Gerhard Colm with the assistance of Marilyn Young. In 1956 the National Planning Association obtained a grant from the Ford Foundation to develop improved methods for long-range projections and to carry forward the 1952 estimates to 1970. Its results appeared in October, 1959, in "Long-range projections for economic growth: the American economy in 1970" (Planning Pamphlet No. 107). NPA has developed for organizational members and subscribers a National Economic Projection Series published in annual and quarterly editions.

prospects suitable for the particular decisions at issue. I have emphasized this point before<sup>2</sup> but I also emphasize the point here to warn that the general projections of economic growth possibilities presented in this chapter may need to be adapted in various ways to the problems of land use and needed adjustments in public and private policies at which this book is aimed.

It is especially appropriate that these first chapters should be devoted to analysis of the long-range growth prospects of the economy as a whole as well as those sectors and aspects with peculiar relevance to the land use problem. As I have stated elsewhere:

Confidence in the Nation's potential for future economic growth has been the fundamental assumption upon which public and private economic policies have been based in the United States since its founding.) Though occasionally challenged during unexpected reverses, as during the 1930s when concepts of economic maturity and stagnation were brought into the debates over economic policies for a time, this basic belief in the possibilities or opportunities for future increases in employment, output, and in per capita, real purchasing power for a rising population, has survived all vicissitudes of public debate to provide the foundation for public and private economic policies.<sup>3</sup>

Anyone assessing the growth prospects of the American economy in the 1960's must do so on a basis of somewhat different assumptions than he could have legitimately made 30 or 40 years earlier. (Projections of output, employment, income and demand are usually made on the assumption that in the future conditions are likely to prevail which approximate reasonably full employment of the economy's resources.) The near universality of this assumption in long-range projections stems in large part from the fact that achievement of such conditions has been incorporated into the Employment Act of 1946 as part of America's national economic objectives. The Employment Act does not purport to guarantee or insure full employment, an adequate rate of growth and a stable rate of prices, but it does commit the federal government, in cooperation with other public and private agencies, to utilize all its plans, functions and resources to promote the accomplishment of these objectives.<sup>4</sup>

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<sup>2</sup> "Relation of structure and assumption to purpose in making economic projections," a paper presented at the Annual Meeting of the American Statistical Association, September, 1957. See Amer. Stat. Assoc. Proc., Business and Econ. Stat. Sec., 1957, pp. 279-83.

<sup>3</sup> Study Paper No. 20, "The potential economic growth in the United States," by James W. Knowles, assisted by Charles B. Warden, Jr., prepared in connection with the Study of Employment, Growth, and Price Levels, for the Joint Economic Committee, January, 1960 (hereinafter cited as Study Paper No. 20).

<sup>4</sup> Employment Act of 1946, Sec. 2.

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With this commitment as the basis of public policy (it is not unreasonable to assume that on the average, reasonably full employment of resources will be achieved within the framework of a stable level of prices and an adequate rate of growth.)

While this assumption seems legitimate, and indeed the most useful one for the purposes of this book, several cautions should be kept in mind in using such a projection. Although it is legitimate to assume that public and private policies will strive toward these goals, recognition must be given the fact that unqualified success is not at all certain. In designing policies, allowance must be made for some degree of human error. Furthermore, allowance should be made for the fact that the statistics by which the performance of the economy is measured are far from perfect and, ex post, may reflect some rise in average prices and a somewhat slower rate of growth than in fact occurs. The indexes of output and prices do not appear to be free of bias. Lastly, even if we succeed largely in achieving these objectives, full employment will not necessarily be achieved each and every year from now until eternity. If fluctuations in employment, prices, output and the rate of growth can be held within reasonably narrow limits, this will be success indeed, and no one, I am sure, will be so impractical as to view modest fluctuations in activity as major policy failures.

From the foregoing it follows that in the projections presented below, (the following assumptions have been made explicitly;)

(1) Prices are assumed to remain reasonably stable during the 1960's and 1970's, the price level being measured in terms of the implicit price deflator for gross national product as computed by the Office of Business Economics, United States Department of Commerce.

(2) The economy is assumed to operate at reasonably full employment with an absence of either war, other disturbing international catastrophies or large and persistent depressions during the period of the projection (1959-1980).

(3) For purposes of this chapter, full employment is defined as representing a state of labor markets such that unemployment as a percent of the civilian labor force will average about 4 percent.<sup>5</sup>

I should, at this point, give a brief explanation of the meaning I attach to a term used throughout this chapter — namely, potential output. In accordance with past usage by myself as well as the staff of the Joint Economic Committee, I shall refer to a “full”

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<sup>5</sup> Projections given in this chapter are consistent with those in Chapter 4 of Study Paper No. 20 (op. cit.).

employment gross national product measured in constant dollars as potential output. Potential output is not the upper limit to which the economy's rate of output can be pushed and, therefore, (it is not a measure of capacity). The distinction here drawn is considered at somewhat greater length in my study for the Joint Economic Committee, and I refer to Chapter I of that paper, especially pages 6 and following, for further development of this point.

(The potential output level represents the amount the economy could produce at some stipulated rate of use of the labor force and of capital, and under the assumption that productive resources are used at something approaching the economy's notion of a least-cost combination of inputs) That is, capacity, however conceived, is being operated so as to produce output at the least cost per unit of output, in accordance with the best practices possible with existing management, capital and training and knowledge of the labor force. It is, in a word, a measure of what practical man can do under the usual operating conditions maintainable over long periods of time without excess strain or breakdown, on the one hand, or, on the other, excessive, wasteful slack in the system, particularly prolonged, involuntary unemployment of labor.

In the light of this framework, I shall present projections of the economy's potential output for the years 1960-1980 by five-year intervals. The next step will be the analysis of possible developments on the demand side consistent with this potential output; and, finally, I shall examine some implications of alternative projections.

### GROWTH IN POTENTIAL OUTPUT TO 1980

It has been common practice in making long-range projections to derive the estimate of possible output in the target year from projections of population and the corresponding labor force, combined with an assumed rate of change in hours of work and in output per man-hour. Projections are usually made separately for agricultural, governmental and private non-agricultural output, though sometimes the private non-agricultural sector has been further subdivided. This procedure implicitly assumes some type of production function relating output to inputs of labor, capital and other productive resources.

The present projections are made by use of an explicit production function which was derived as the central part of my recent study paper on potential economic growth. (The production

function was developed as a tool for estimating the economy's output under conditions of sustainable "maximum employment, production and purchasing power.") It therefore was designed to have the following characteristics:

1. It should incorporate measures of as many of the identifiable productive resources as is possible in light of availability of data, especially

- (a) labor
- (b) tangible capital: plant, equipment, etc.
- (c) the state of technology and its changes and
- (d) other intangibles such as research, health, education, etc.

2. It should incorporate a procedure for separating changes associated with cyclical and other short-run fluctuations from changes reflecting secular influences.

3. Provision should be made to separate changes in output due to shifts in the production function itself in response to changes in techniques, etc., from changes in output reflecting increases in the supply of the productive services of labor and capital.

4. A procedure is needed for allowing for influences on aggregate output and on the productivity of inputs arising solely out of shifts in demand between goods and services with varying requirements for productive resources — i.e., between those with higher or lower requirements for capital, and higher or lower requirements for labor.

5. If possible, specific provision should be made to measure the influence of changes in quality of inputs and outputs on the production function.

6. Since the absolute magnitudes of the measures of inputs and outputs for the economy as a whole will depend on the particular price structure used to price inputs and outputs and on various conventions of mensuration, these absolute levels will be of little significance. Primary attention must center on changes between time periods — year to year — and on relative proportions between measures in each period. Therefore the form of the function should be chosen so as to operate in terms of rates of change.

The equation for the derived production function was expressed in logs in the following form:

$$\begin{aligned} \log O_m = & - 5.43104 + \log L_p + .9104 \log (L_a/L_p) \\ & - 3.39 [\log (L_a/L_p)]^2 + .35 \log (K/L_p) - 5.6411 \log k \\ & + 10.356 (\log k)^2 + X + .00884t \end{aligned}$$

where:  $O_m$  = computed gross national product in constant 1954 dollars

$L_p$  = potential labor input in man-hours

$L_a$  = actual labor input in man-hours

$K$  = stock of private productive capital exclusive of housing and gross of depreciation in constant prices

$k$  = the average age of the capital stock

$X$  = index adjusting for the influence of changes in the composition of demand on productivity of inputs

and  $t$  was measured in years with 1909 as the origin.

The potential output  $O_p$  can be computed from the same formula by simply dropping out the cyclical terms involving the ratio  $L_a/L_p$ . By using this formula, allowance can be made for the influence on potential output of changes in availability of supplies of labor and capital, in the average age or technological condition of the capital stock, in the progress of technology as measured by the time trend ( $t$ ) and in the demand mix. The time trend indicates a rate of technological progress of about 2.1 percent per year. (The projections, therefore, depend not merely upon the trends in population, labor force and productivity as in the usual projections but also upon explicit assumptions concerning the course of capital investment and the composition of demand.)

The projection presented here (corresponding to the medium, or "B" projection in Study Paper 20) assumes that our economic affairs are managed in both the private and public areas so as to attain reasonable success in maintaining maximum employment. It assumes that no deep or prolonged depression will occur and no war, as noted above, but does assume that there will be occasional recessions such as have disturbed the course of economic growth since World War II.

The projection of the labor force, therefore, is derived from a medium projection of the population combined with participation rates which would represent a continuation of recent trends. The labor force projection, therefore, is in about the middle of the range of such projections, particularly those of the Department of Labor.<sup>6</sup> The total labor force, including the armed forces, is

<sup>6</sup>See U. S. Bureau of the Census, series P-25, No. 187, Nov. 10, 1958, "Illustrative projections of the population of the United States, by age and sex, 1960 to 1980," and U. S. Bureau of Labor Statistics, Bul. 1242, "Population and labor force projections for the United States, 1960 to 1975."

assumed to rise from about 73 million in 1960 to about 103 million in the year 1980. This increase is equivalent to an annual rate of about 1.7 percent per year. Since a constant rate of unemployment of 4 percent is assumed, total employment, including the armed forces, increases also at a rate of 1.7 percent a year.

Average annual hours of work have tended to decline from 1910 to 1960 at a rate of about 0.6 percent per year. The rate has been considerably faster in recessions or deep and prolonged depressions, such as in the 1930's, and slower in the more prosperous periods. A somewhat slower rate of decline from 1960 to 1980 is assumed, or about 0.5 percent per year.

The combination of the 1.7 percent per year increase in the total labor force, including the armed forces, and an average rate of decline of about 0.5 percent per year in average hours of work produces an assumed average rate of increase in total man-hours of about 1.2 percent per year.

During the 1910 to 1960 period, the stock of private plant and equipment in constant prices has increased about 2.2 percent per year. The rate has varied widely, depending on economic conditions. The rate is substantially higher in prosperous periods and lower in recessions, even declining in the depression of the 1930's. For these projections, the rate of capital accumulation has been assumed to be somewhat more modest than could reasonably be achieved but still consistent with the assumption that serious depression will be avoided, or about 2.7 percent a year. Consistent with this, the average age of the capital stock is assumed to decline almost imperceptibly, or by about 0.1 percent per year — mostly as a result of a faster rate of growth of equipment than of plant.

Changes in the composition of demand tended to add an average of about 0.1 percent per year to the rate of growth in output. In considerable part, this has been a result of the shift from agricultural to non-agricultural production and of shifts between private and public employment. The assumption is made that changes in composition of demand during the 1960's and 1970's would be almost neutral.

These assumptions, when combined through the formula previously cited, produce a rate of growth of potential gross national product in constant prices of about 4 percent per year. Since in 1959 output was about 7 percent below the computed potential for that year, the rate of growth from the actual output of 1959 would be higher than 4 percent per year. This projection gives a rate of growth one-third higher than that achieved in the 1910 to 1960 period. Why? The foremost reason is to be found in the basic assumption that deep, prolonged depressions will be avoided in

the 1960's and 1970's. Growth was interrupted between 1929 and 1941 by such a depression. The assumption that this will not be repeated has a pervasive influence on the projections. It affects the rate of growth of the labor force, the rate of decline in hours of work, the rate of accumulation of capital, the speed with which new technology is incorporated in actual production processes and the composition of demand.

For example, during the 1910 to 1960 period the average rate of increase in the capital stock has been only about 2.2 percent a year because of the long period of low investment during the 1930's. In fact, from 1930-31 until 1945 the growth in the gross capital stock was barely sufficient to keep pace with the rise in potential labor input so that the capital-labor ratio remained almost constant for over a decade. There was capital widening but no capital deepening. The assumption that deep and prolonged depression will be avoided in the 1960's and 1970's raises the average rate of growth of the capital stock such that even on the rather modest assumption of a capital stock growth of 2.7 percent a year the capital-labor ratio rises by an average of about 1.5 percent per year. Furthermore, since 1910 the average age of the capital stock has risen in part because of the depression of the 1930's, whereas, on the average, it is likely to fall slightly during the 1960's and 1970's if our assumptions prove to be an accurate reflection of subsequent events.

In general, the assumptions underlying this projection are conservative. Competent students have prepared analyses of historical tendencies and future prospects under reasonably prosperous conditions which, on the basis of the formula used in this chapter, would lead to even higher rates of growth. In Study Paper No. 20 a growth rate of 4.6 percent a year was at the high end of a potential range of possibilities, and the lowest figure that seemed reasonable, if serious depression is avoided, came out only as low as 3.5 percent per year.

Before proceeding further, it should be noted that these projections do not assume any radical or fundamental changes in our economic system. The projected output can be achieved without instituting elaborate controls and without having the government impose a pattern of consumption or a forced-draft high rate of capital accumulation.

If this projection should be realized, then, assuming prices to average the same as in 1949, the potential gross national product would rise from about \$514 billion in 1959 to \$532 billion in 1960, then to \$1,175 billion in 1980. By five-year periods, the figures run as follows:



Potential GNP

<u>Years</u>	<u>In 1954 dollars</u>	<u>In 1959 dollars</u>
1959	456 billion	514 billion
1960	473	532
1965	577	649
1970	703	791
1975	856	964
1980	1,044	1,175

## DEMAND POSSIBILITIES IN A GROWING ECONOMY

The development of acceptable assumptions respecting the possible future growth of potential output under full employment conditions is a formidable assignment, but to perform the equivalent task for demand presents an even more difficult and hazardous assignment. Not only are there difficulties relating to the detection of trends in expenditures generated by changes in incomes, population and relative prices, there is the further and more challenging task of dealing with the foreseeable fact that most of the goods and services which will be purchased by consumers, business and government 20 years hence have no close counterpart at the present time.

Would a forecaster in 1940 have been able to perceive that in 1960 consumers would be spending very substantial proportions of their budget on such items as television or swimming pools? This difficulty accounts, in part, for the fact that long-range projections are much more likely to be too low than to be too high.

Total government expenditures for goods and services — federal, state, and local — in 1959 amounted to \$97.6 billion, or about 20 percent of the gross national product. If past trends prevail during the 1960's and 1970's, this total could increase to about \$240 billion, or about the same proportion of the potential gross national product in 1980. Although the proportion of gross national product may be about the same in the two years, the internal composition is likely to change considerably. Unless the international situation changes materially, federal expenditures on national defense programs are likely to increase at a moderate rate — a safe assumption would be approximately \$55 billion compared to the 1960 levels of about \$45 billion. This assumes that, in spite of the increasing complexity and cost of major defense weapons systems, national defense expenditures can decline from 1960 levels of about 9-10 percent of the gross national product to about 5 percent or less in 1980. In addition to national

defense, the federal government faces the prospect of an increase in other civilian expenditures for goods and services as population increases, since most of the civilian programs are directly dependent on the size of the population and the level of personal incomes. These civilian programs, which were about 1.8 percent of gross national product in 1959, are assumed to be only about 1.7 percent by 1980, or perhaps \$20 billion. As noted, this does not include transfers.

The major impact of rising demands for government services by a larger and wealthier population is likely to fall upon those types of services which traditionally have been handled mainly by state and local governments. Therefore, state and local government expenditures for goods and services, which have been running a little over 8 percent of gross national product, may increase in two decades to almost double their present share. For present purposes, the share is assumed to grow to about 14 percent, or about \$165 billion by 1980. Such an increase is hardly an unreasonable expectation in view of past trends and the prospective increase in population requiring police, fire, court and related services as well as a demand, through a great increase of children and young people, for educational services.

At times when actual output closely approximates potential output, that is, when there are reasonably full employment conditions, there has been a tendency for the share of consumption in total output to be rather stable. As a percentage of the gross national product, it has varied within the limits of 63 to 70 percent, with much of the variation being in the durable goods area. Taking into consideration the prospects for growth of income and population consistent with the projection of potential gross national product, consumer expenditures might average about 67 percent of the gross national product by 1980, which would yield a total of \$790 billion in terms of the 1959 price level, or almost two-thirds again as much as the entire gross national product for 1959. If realized, this would mean a rise in per capita consumption from \$1,761 to \$3,147 in 1959 dollars, or an increase of 79 percent in real per capita consumption over a period of 20 years.

The introduction of new products, changes in social aspirations or tastes, growth in the number of households headed by retired workers, more leisure and changes in the proportions of the population in different age-sex groups are likely to result in substantial changes in consumption patterns. It seems probable, however, that the broad general division of consumption between durable goods, nondurable goods and services will roughly correspond to the relative proportions of high employment years. In this chapter no attempt is made to spell out consumption patterns

in detail since this book is mainly concerned with foods, fibers and other products derived from land, and these prospects will be gone into more thoroughly in other chapters.

The growth in potential output at a rate of 4 percent a year during the 1960's and 1970's would require substantial investment each year in new plants, equipment and inventories. Population growth, rising incomes, results of research and development expenditures and competitive pressures, both domestic and foreign, will vastly expand investment opportunities. It must be recognized, however, that just as output per man-hour increases, so it is likely that a long period devoid of war or serious depression would be accompanied by a rise in output per unit of capital. The potential output projections to 1980 of 4 percent a year imply a rate of increase of about 2.8 percent a year in output per man-hour for the economy as a whole. But they also imply a rate of increase of about 1 percent a year in output per unit of capital.

The additional investment for expansion will be a smaller percentage of gross national product in 1980 than it is in 1960. At prices assumed to be at 1960 levels, a 4 percent a year expansion in potential output for the economy as a whole requires an additional investment in business plant and equipment equivalent to about 4.1 percent of gross national product and replacement of old assets about 5.2 percent, or a total of 9.3 percent of gross national product. By 1980, expansion of output at 4 percent per year would require investment of only about 3.0 percent of gross national product and replacement about 4.5 percent, or a total of about 7.5 percent of potential output.

On this basis, business expenditures for plant and equipment could be expected to rise from about \$44 billion in 1960 to about \$88 billion in 1980. In addition the increase in the potential output would be accompanied by annual additions to inventories, which is assumed to average about 0.5 percent of gross national product, or about \$6 billion per year.

A rise in population with accompanying increases in annual family formation can be expected to create substantial demands for residential housing both in total and per family or per person as per capita incomes also rise. If such increases run in line with the expectation of most experts in the field of housing, then in terms of 1960 prices, total expenditures, as we find them in the national income and output accounts, could average about \$46 billion per year, or about 4 percent of gross national product.

An important factor in the estimate of future demand is the question of net exports. This is a very difficult area in which to develop assumptions about future growth possibilities. Growing incomes and populations will obviously create growing demands

here for both raw materials and finished goods from other countries. It seems safe also to assume that high rates of growth, both in the developed countries, such as Western Europe, and in the underdeveloped countries, are likely to create larger demands for American exports. Certainly this latter would seem likely if general expectations are realized — that many of these countries which in 1960 have per capita incomes below the United States will raise their outputs and incomes at a faster rate per year than does the United States. But though it seems easy to make generalized assertions, the reduction of the possibilities to a consistent and explainable quantitative estimate is beyond my resources. I therefore have assumed arbitrarily that net exports will be slightly under 0.5 percent a year — not far from past experience.

The sum of these estimates of demand possibilities — since they have been largely based on population and income prospects consistent with the potential output already developed — will add up to a gross national expenditure of \$1,175 billion.

### SOME IMPLICATIONS AND ALTERNATIVES

The first implication of this analysis is that a 4 percent rate of growth is, after all, very conservative. In the past, the United States has been able to devote as much as 10 to 13 percent of the total gross national product to the replacement and expansion of the stock of private plant and equipment. The projections assume that by 1980 only about 7.5 percent will be so used if potential output rises at 4 percent per year. An increase in the rate of growth would raise replacement requirements only slightly and slowly so that devotion of a larger percentage of gross national product to gross investment in plant and equipment would make possible a significantly higher rate of growth. Even the 4.6 percent a year, which was the high estimate presented in Study Paper No. 20, is rather conservative in the light of both past experience and the nation's increasing technological and managerial know-how.

Second, the problem of scarcity of savings, about which there has been so much discussion, may not be a very likely future prospect if conditions work out along the lines outlined above. The potential cash flows to business under the assumed conditions and the flow of personal savings imply savings enough for all private demands. Hence, tight conditions in capital markets would be likely to develop only if the demands for funds to finance by new indebtedness some of the rising costs of state and local

governments become too large. If, at high employment levels, ways and means are found to maintain a surplus in the federal budget (which under projected conditions would not be difficult), and state and local governments do not finance too high a proportion of their annual capital outlays by borrowing, then the federal surplus should offset the state and local deficits. The flow of savings should be adequate, therefore, and, indeed, it would be not unexpected if interest rates more often tended to be weak than strong, with the long-run trend toward declining rates reasserting itself.

Finally, I would like to emphasize the implications of these projections for the problem of taxation and state and local financing. If we are to continue to finance the government services for our rising population through state and local channels, substantial innovations clearly will be needed. Newer methods and newer institutions will need to be explored and developed to practical usefulness. Furthermore, state and local tax structures will demand close study. One of the most important automatic stabilizers which contributes to offsetting tendencies toward inflationary expansion, on the one hand, and recession, on the other, is the total federal, state and local tax and expenditure structures which tend to shift from surplus to deficit and back again more rapidly and to a greater proportionate extent than the changes in output, employment and income to which they respond. But this is largely the result of federal rather than state and local fiscal operations. If, during the 1960's and 1970's, the share of the federal government in gross national product declines, as here assumed, and the share of state and local governments rises, the potential contribution of governmental receipts and expenditures to the automatic stabilization of the economy will be seriously impaired.

One of the important problems of stabilization policy, therefore, seems very likely to be the development of new techniques for dealing with these tendencies. This is particularly true in view of the prospective demands upon state and local governments and the sources from which they can raise additional revenue. Though much attention is given, and rightly, to needed reforms in the federal tax structure, it seems likely that reforms in state and local tax will be a much more difficult and important problem, while reform of the federal tax structure is likely to grow easier and perhaps to be of lesser significance. This conclusion, of course, is readily apparent from the practical consideration that federal tax reform can be made within the framework of a series of tax reductions, while state and local authorities face the more difficult task of bringing about tax reforms in the face of a need for ever larger receipts from taxes to finance continually rising expenditures.