POTENTIAL FOR EXPANSION OF NATIONAL SECURITY PROGRAMS

A STUDY OF ECONOMIC FEASIBILITY

Prepared for:

OFFICE OF THE CHIEF OF ORDNANCE, U.S. ARMY
THE PENTAGON WASHINGTON, D.C.
OFFICE OF THE CHIEF SIGNAL OFFICER, U.S. ARMY
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(6) **POTENTIAL FOR EXPANSION OF NATIONAL SECURITY PROGRAMS – A STUDY OF ECONOMIC FEASIBILITY**

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INTRODUCTION

Objective

This study was designed to investigate the total amount of resources that the United States could devote to national security programs, assuming continuing peacetime, cold-war conditions during the decade of the sixties. Specifically, it considers the feasibility of achieving certain levels of expansion of total national security expenditures, within the short lead-times of a three-year buildup, as well as the longer-run rates of continued growth of these expenditures that could be sustained thereafter. Feasibility is evaluated in terms of resource availabilities and tax requirements, monetary policy, inflation, need for direct controls, the international balance of payments, and associated levels of other government activities and of private investment and consumption.

No attempt is made here to evaluate the necessity for any given defense programs or any particular level of security expenditures. Efficiency in existing and new programs, and economies in government operations are considered to be outside the scope of this inquiry.

Background

The Soviet Union in recent years has challenged the United States in the economic as well as the political and military spheres. A companion study, to be published shortly, examines this challenge and reaches the conclusion that the USSR gives every indication of being able to continue rapid economic growth (around 6 percent a year) and thus to underwrite large military efforts and growing economic warfare, while steadily improving the standard of living of her citizens.

U.S. output (GNP) has been growing since World War II at a rate of 3-1/2 percent a year, and more slowly than that during the last five years. Our economy is approximately twice the size of the Soviet Union's, but we put no more resources into national security programs than the Russians do. The added resources which our economy generates annually for private investment, government programs, and consumer gains are no greater than those which the Soviets realize from their higher growth rate. Although they devote much less than we to consumption, their annual per capita rate of improvement in the standard of living is much greater. Thus, despite our much larger total output, we find the Soviets confronting us with what appears to be a significant economic challenge. What is our capability to meet this challenge?

In the United States, there has been a widely held belief that major increases in our national security expenditures require corresponding reductions in other programs, or else that private sacrifices would be required to permit expansion of total government activity. Such an assumption has an important bearing on SRI's Defense Evaluation Program.

Under Contract ORD-710, much of SRI's work is concerned with determining the technical and military feasibility constraints on air and missile defense programs in specified future years. The third general category of feasibility--the effective availability of resources--may also prove constraining. If all resources are considered together, this may be called the economic feasibility criterion.

In the past, SRI has undertaken time-phased cost analyses of a number of weapons systems and programs. Having determined costs, however, it is not possible, unless the costs are very small, to state a priori that a program is economically feasible without some knowledge of what is feasible in the aggregate. It is important, then, that program evaluation be put in economic perspective. Are the programs in the aggregate feasible? Under what conditions? In what state of urgency? Are they all only marginally feasible, so that errors of estimate become critical? Are the estimated economic constraints so far above the levels of projected programs as to be inoperative--i.e., as to afford a high degree of confidence or even virtual certainty of feasibility?

It was to provide an up-to-date, documented statement of the limits and conditions of economic feasibility that this study was undertaken. It is hoped that its publication will provide the framework or reference point that will enable SRI and the Army in the future to assess the economic feasibility of given programs.

Approach

In order to focus sharply on the economic feasibility of aggregate security expenditures, it is necessary to specify certain major assumptions. These follow directly from the objective of determining feasibility under peacetime, cold-war conditions. First, although we are not assuming the shape of the national security effort--what mix of weapons systems, research and development programs, civil defenses, aid to allies, and arms control systems may be adopted--we do assume that there will be no major new draft of military manpower, such as might be associated with the outbreak or immediate threat of hot war. Patently, the size of the Armed Forces may vary with changes in military equipment procurement, but such variation is assumed to be relatively minor under peacetime conditions.

Second, we assume not only no damage to the national plant from enemy attack but also no major specific resource constraints, such as might be imposed by the pre-empting of large segments of the national transportation resources for the transport of a large expeditionary force or by enemy interdiction of supply lines for imported raw materials. It is, in fact, assumed that there will be no shortages of particular raw materials of sufficient stringency to prevent achievement of the over-all levels of expansion projected in the study.

Having stated other major assumptions in Chapter 1, we turn in Chapter 2 to the two recent historical examples of major, rapid expansion of national security programs--World War II and Korea. The history of national security and other government expenditures is reviewed, along with that of investment and consumption. The sources of wartime expansion--changes in labor force, employment, and hours of work, as well as productivity, or output per hour, are considered and measured.

In Chapter 3, economic theory explaining the wartime economic phenomena is presented. The significance of excess capacity and the nature of the multiplier effect of increased government expenditures on total gross national product are discussed.

On the basis of these historical models and their analytical explanations, and in light of postwar economic trends, it is possible in Chapter 4 to construct short-run models of the economy, projecting levels of expenditure for national security programs and associated levels of other governmental activities, private investment, and consumption that could be reached by 1964, assuming low, moderate, and relatively high degrees of national effort. Requirements for direct controls and for the deferment of investment are explicitly treated.

The implications of rapid expansion are examined in Chapter 5. Of major importance is the question of what level of taxes would be required for the projected programs, and what changes in the tax structure would be indicated. To answer requires consideration of the associated monetary policies and of the possibility of temporary direct controls. In addition, there is a role for selective price increases in reallocating resources, with associated implications for the trend of inflation. Another possible constraint might be adverse effects on the international balance of payments, and the likelihood of these is evaluated.

Finally, we are ready in Chapter 6 to consider what could be done over the long haul. Temporary controls, deferred investment, and "taking up the slack" of unused capacity are no longer available as means of expansion. Sustainable trends in employment, hours, and productivity are

therefore estimated, along with the continuing requirements for investment, in order to make projections to 1970, parallel to those made for 1964.

Findings

1. The United States could rapidly increase its national security expenditures from the current level of $46 billion per year. Levels of $53 billion, $84 billion, and $145 billion per year by 1964 are examined and found to be feasible.

2. These additional annual expenditures could be obtained from increased output. The standard of living could continue to climb as fast or faster than heretofore. The trend toward increased leisure need not be stopped, though it might be slowed.

3. If the need for large programs should persist, the 1964 levels could be maintained or raised annually by 4-1/2 to 5-1/2 percent through 1970.

4. The highest of the projected levels of security expenditures would require increases in the over-all rate of taxation of 30 percent or more in order to avoid marked acceleration of inflation. Such increases would require some changes in the present structure of taxes.

5. Full achievement of the highest projections, on schedule, would also require the temporary use of some direct controls over prices and the consumption of raw materials and consumer goods, but these would probably be no more severe than the controls of the Korean period.

6. The problems of fiscal and monetary policy, temporary direct controls, and the international balance of payments are not so severe as to prevent achievement of the projected program levels.

7. In summary, the economy possesses the instrumentalities and the resources for expanding security expenditures more rapidly even than has been proposed by advocates of larger defense expenditures.

Chapter 1

THE PROBLEM--
HOW MUCH EXPANSION OF SECURITY PROGRAMS IS ECONOMICALLY FEASIBLE?

This is a study of what, in light of the size and functioning of the economy, the United States can support in the way of national security expenditures under peacetime, or continued cold-war, conditions. The analysis, however, is in terms of total government expenditures--federal, state, and local--for all purposes. Particular patterns of defense, or security, programs at given levels are not specified. The economic limits appear to depend on the consequences of the expansion of total spending by government. The economic feasibility of increased total government spending is appraised without passing judgment on the desirability of such an increase, or of any particular level or pattern of expenditure.

We shall first examine recent experience, with particular emphasis on the patterns of expenditures in World War II and the Korean period. Next we shall test the feasibility of three alternative projections of government expenditures. Finally, we shall examine some of the economic policy problems arising from the alternative projections.

The need for such an examination arises because of a common belief that government expenditures, more particularly the federal budget, must be held to about the present level, regardless of the urgency of specific programs. The problem was underscored in the recent hearings before a subcommittee of the Joint Economic Committee. Professor W. W. Rostow, testifying on the challenge presented by Soviet economic growth and the military program made possible by it, identified what he considers "four of our worst mistakes in modern history." The two most recent of these, he said, were "the belief of the Democratic administration before June 1950 that our society could not afford a military budget of more than $15 billion; and . . . the similar belief of the present administration that its overriding mission has been to reduce the public budget it inherited, despite the accelerated challenge it has faced since 1953 in many dimensions."[1/] These were political, not economic judgments.

1/ U.S. Congress, Joint Economic Committee, Comparisons of the United States and Soviet Economies, Hearings before the Subcommittee on Economic Statistics, 86th Congress, 1st Session, November 13-20, 1959, p. 252.

Much of our analysis will be in terms of the gross national product (GNP) and its counterpart, the gross national expenditure. The GNP is simply the market value of all goods and services produced. It can be divided into four major components:

1. Government Expenditures (GE)--the total goods and services purchased by federal, state, and local governments (including both investment and consumption, which are not separated in government accounting as they are in the private sector, per category [2]);[1/] federal expenditure are further broken down between National Security and Other; National Security corresponds closely to the "major national security" classification used in the federal budget and includes primarily defense (including foreign military assistance), atomic energy, stockpiling, and defense production expansion.

2. Gross Private Expenditures (GPE)--the remainder of GNP after subtraction of GE are further broken down into:

   a. Investment (I), which includes Gross Private Domestic Investment (GPDI) and Net Export of Goods and Services (NE) (exports minus imports, or the foreign trade balance, the balance of our trade with the rest of the world).

1/ We are concerned here with the impact of government expenditures upon total national output and with the sharing of output between government claims and the claims of consumption, investment, and net exports. It is necessary, therefore, to use a measure of government expenditures that relates them to current output.

Total budget expenditures as conventionally reported include some items (such as intragovernmental transactions) that result in no claim on current output and omit others (such as federal trust-fund expenditures for highways) that make a direct claim on output. Adjustments to eliminate the one type and include the other type of expenditure yield a second total, designated cash payments to the public.

Cash payments to the public are subject, in turn, to comparatively minor adjustments for "agency coverage," "netting and consolidation," "timing," and "capital transactions," before one arrives at expenditures, as included in the national income accounts.

Government expenditures in the national income accounts include very considerable amounts that represent merely transfer of dollars rather than an exchange for current output. Social Security benefits represent a major type of transfer payments. These must be deducted from

b. Consumption (C), or consumer expenditures on goods and services, at most times by far the largest single category of GNP.

Note that GPE is not the same thing as gross private product (GPP), which is GNP less government payments of wages and salaries; in other words, part of GPP is taken up by government purchases, out of GE, so that GPE is less than GPP.

As stated at the outset, the analysis assumes continued peace, or cold war. While national security expenditures are separately estimated, their pattern is not specified. We are interested in the total economic limits on all security programs, including research and development, weapons systems, arms control systems, civil defense, overseas aid, and any others found necessary to the protection of the nation. Within the total, given programs at given times may well be limited by particular resource shortages--a particular component or specially trained personnel, for example. But if we allow reasonable minimum leadtimes, these problems can usually be worked out in a free, price-regulated economy;[1/] the only general over-all limitations are those of the total labor force and the total productive power of the country, as measured in GNP. Thus, for the most part the analysis that follows would apply equally well to an expansion of

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the cash total, as is true also of federal grants-in-aid to state and local governments, net interest payments, and subsidies. Deduction of these payments reduces the total to government expenditures on goods and services, which is to say, on current output. It is this concept and this measure of government expenditures that we must use for purposes of the present analysis.

(A detailed reconciliation of the conventional federal budget expenditures with federal cash payments to the public and federal expenditures on national income account is contained in Table D-55 of the Economic Report of the President, 1960. In Table D-54, federal expenditures as shown in the national income accounts are broken down among the several categories identified above, chief among them being federal expenditures on goods and services.)

1/ There comes a point, even in peacetime, when temporary direct government controls may be needed to supplement the price mechanism, if given programs are to be accomplished on schedule. This problem is discussed in Chapter 8.

government programs in which nondefense, or nonnational security, activities were included; it would not necessarily apply, however, to a nations security program that entailed a large military draft of manpower--but this we assume to be associated only with hot war.

The services of draftees are included in the GNP at the amount of their total pay and allowances (just as are other military manpower and civilian employees of the government). This amount is apt to be significantly less than the average contribution to GNP of at least a large part of the draftee group as civilians. The analysis would have to take account of this fact if a large draft were assumed in the period covered. This does not mean that there might not be additional employment of military personnel in conjunction with new or expanded military programs in peacetime, but simply that it is assumed that the numbers will not be large, particularly in the draftee category, in which the average pay and allowances are furthest below the national average output per worker (or the average for the categories from which the conscripts are likely to be drawn).

The assumption of peacetime allows us to rule out other types of bottlenecks as well. In time of war, imports from many countries become unavailable or less available, for such reasons as enemy interdiction, enemy competitive or pre-emptive buying, and military pre-emption of tran port facilities. Such scarcities would impose additional strains on the economy which need not be allowed for here. And of course, future wars, unlike those of the past, may bring attack damage to the United States which would limit potential GNP.

On the other hand, in peacetime there may not be some of the positive forces which in wartime help to increase the national output--the incentives to join the labor force, to work longer hours, to accept the postponement of both investment and consumption, and to accept government controls. We shall attempt to take account of these factors.

We shall start our study with an examination of the history of the U.S. GNP and its allocation, focusing on World War II, the postwar years, and the Korean period. Such comparisons of dollar aggregates at different periods of time are not meaningful for our purposes if they reflect significant changes in prices. Accordingly, adjustments to eliminate price changes have been based on the very careful computations made by the Department of Commerce, the agency that compiles the national income and product accounts. The adjusted, or "deflated" figures are referred to as being in "stable" or "constant" prices, in "constant dollars," or, generally throughout this report, in "1959 dollars," since the 1959 basis is used except where otherwise specified. Unadjusted figures are "at current

prices" or "in current dollars." GNP in constant dollars is often called "real" GNP, since it reflects national product trends as nearly as possible in terms of real resources, rather than in monetary terms.

The above phrase, "as nearly as practicable," is used in recognition of the conceptual and practical difficulties of measurement. The observation of prices and the computation of price indexes for use as "deflators," or adjustment factors, are a complex and imprecise process. During times of rapid change--especially wartime--errors are likely to accumulate and cause bias. We all remember, for example, how sluggish the old "cost-of-living index" seemed in reporting price increases during World War II, when we could "feel" prices going up faster than the index almost from day to day. However, biases in the cost of living index are not the whole story. Other deflators used by the Department of Commerce are not all so understated, and there were other forces operating in the opposite direction. These arise out of problems in accounting for the effect of structural changes in GNP, which are especially marked in wartime, when the composition of output--"product mix"--changes radically. A useful discussion of the problems involved, for the interested reader, is that by Simon Kuznets, who concludes that from 1939 to 1943, probably the most extreme possible example, the Commerce Department underestimated the increase in GNP in 1939 dollars by about 6 percent.[1/] To the extent that Kuznets is correct, we have been conservative in our findings as to the expansibility demonstrated during the war, and perhaps to a lesser extent also during Korea (see Chapter 2). The main point is, however, that the magnitude of the possible errors is not significant for our purposes; better data, if they were available, would not change the nature of our conclusions, which are relatively insensitive to small differences in the estimates of past inflation.

1/ National Product in Wartime, by Simon Kuznets, National Bureau of Economic Research, New York, 1945, p. 57.

Chapter 2

THE LESSONS OF WARTIME EXPERIENCE--1940-44 AND 1950-53

During the past 30 years, 1929 to 1959, gross national product (GNP), expressed in terms of 1959 dollars, has increased by an average of 2.9 percent a year. Between 1947 and 1959,[1/] the rate was 3.5 percent, reflecting expansion at an average rate of 4.3 percent a year to 1955, and 2.0 percent or less than half that rate, thereafter. (From 1929 to 1938 there was no growth--actually, a slight decline.) Gross national product and the major components are shown for the years 1929 to 1959 in Tables I and II, and are illustrated for 1939-59 in Figure 1.

Twice during the 30 years there was a sharp expansion of government expenditures, occasioned by war, and each time this was accompanied by abnormally rapid expansion of gross national product. Between 1940 and 1944 (World War II) there was, even in constant (1959) dollars, a fourfold (388 percent) increase in government expenditures on goods and services, or nearly 50 percent a year. Gross national product increased during these years at an annual rate of 12.3 percent, more than four times as rapidly as the average from 1929 to 1959. Similarly, between 1950 and 1953 (Korea) government expenditures nearly doubled (increasing at 23.2 percent a year), and national output expanded at a rate of 5.4 percent, close to double the longer-run average. All comparisons, as is true of most of those that follow (the exceptions being noted), are made in terms of 1959 prices (see Chapter 1).

The Record--Much More Output for Government at Little Cost to the Private Economy

If we examine the record of 1940-44 more closely, we discover a fact of great importance for our present study. So great was the increase in output during these years that the total was large enough to

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1/ Postwar trends are measured throughout this paper in terms of the 1947-59 average. The year 1946 is omitted because immediate postwar "reconversion" and adjustment distorted most economic series. Both 1947 and 1959 (the latest year available at time of writing) were years of moderate prosperity, so that they correspond sufficiently to serve as terminal dates.

Table I

GROSS NATIONAL PRODUCT OR EXPENDITURE
1929-1959
(Billions of 1959 Dollars)

Year	(1) Gross National Product (GNP)	(2) Government Purchases of Goods and Services (GE)	(3) Gross Private Expenditures[1] (GPE)	(4) Personal Consumption Expenditures (C)	(5) Gross Private Domestic Investment (I)	(6) Net Exports of Goods and Services (NE)
1929	$203.6	$ 22.4	$181.2	$138.6	$41.5	$1.1
1930	184.4	24.7	159.7	130.3	28.3	1.0
1931	170.3	26.1	144.2	126.2	17.8	0.4
1932	144.8	24.8	120.0	114.8	4.9	0.3
1933	141.4	24.1	117.3	112.1	5.5	-0.3
1934	158.1	27.5	127.6	117.9	9.6	[2]
1935	170.3	27.8	142.5	125.2	18.4	-1.3
1936	194.5	32.5	162.0	138.0	25.4	-1.4
1937	204.8	31.4	173.4	142.9	31.2	-0.8
1938	195.2	34.9	160.3	140.4	18.4	1.6
1939	211.5	36.5	175.0	148.3	25.7	1.1
1940	229.9	37.7	192.2	156.3	34.0	1.9
1941	267.7	57.7	210.0	166.7	43.1	0.3
1942	304.1	121.2	182.9	162.9	22.1	-2.2
1943	341.6	166.9	174.7	167.2	13.3	-5.8
1944	366.3	184.2	182.1	173.1	14.8	-5.9
1945	359.9	158.8	201.1	185.2	20.5	-4.6
1946	316.0	53.2	262.8	207.8	50.0	5.0
1947	315.7	45.0	270.7	211.4	49.9	9.4
1948	327.9	50.9	277.0	215.4	58.4	3.1
1949	328.2	57.1	271.1	220.9	46.4	3.8
1950	356.2	54.6	301.6	234.5	65.7	1.4
1951	385.0	76.6	308.4	236.4	68.3	3.6
1952	399.0	94.1	304.9	242.5	59.8	2.6
1953	417.1	102.0	315.1	254.2	60.4	0.5
1954	408.8	91.1	317.7	257.5	57.9	2.4
1955	441.5	88.6	352.9	277.0	73.5	2.5
1956	450.9	87.5	363.4	286.0	73.1	4.3
1957	458.9	90.9	368.0	293.1	69.1	5.8
1958	448.6	94.9	353.7	295.9	56.0	1.8
1959	478.8	97.9	380.9	311.4	70.3	-0.7

1/ Column 3 is obtained by subtracting column 2 from column 1, and will not necessarily equal the sum of columns 4, 5, and 6, because of rounding.

2/ Less than $50 million.

Source: Economic Report of the President, 1960, Table B-2.

Table II

GOVERNMENT EXPENDITURES
1929-1959
(Billions of 1959 Dollars)

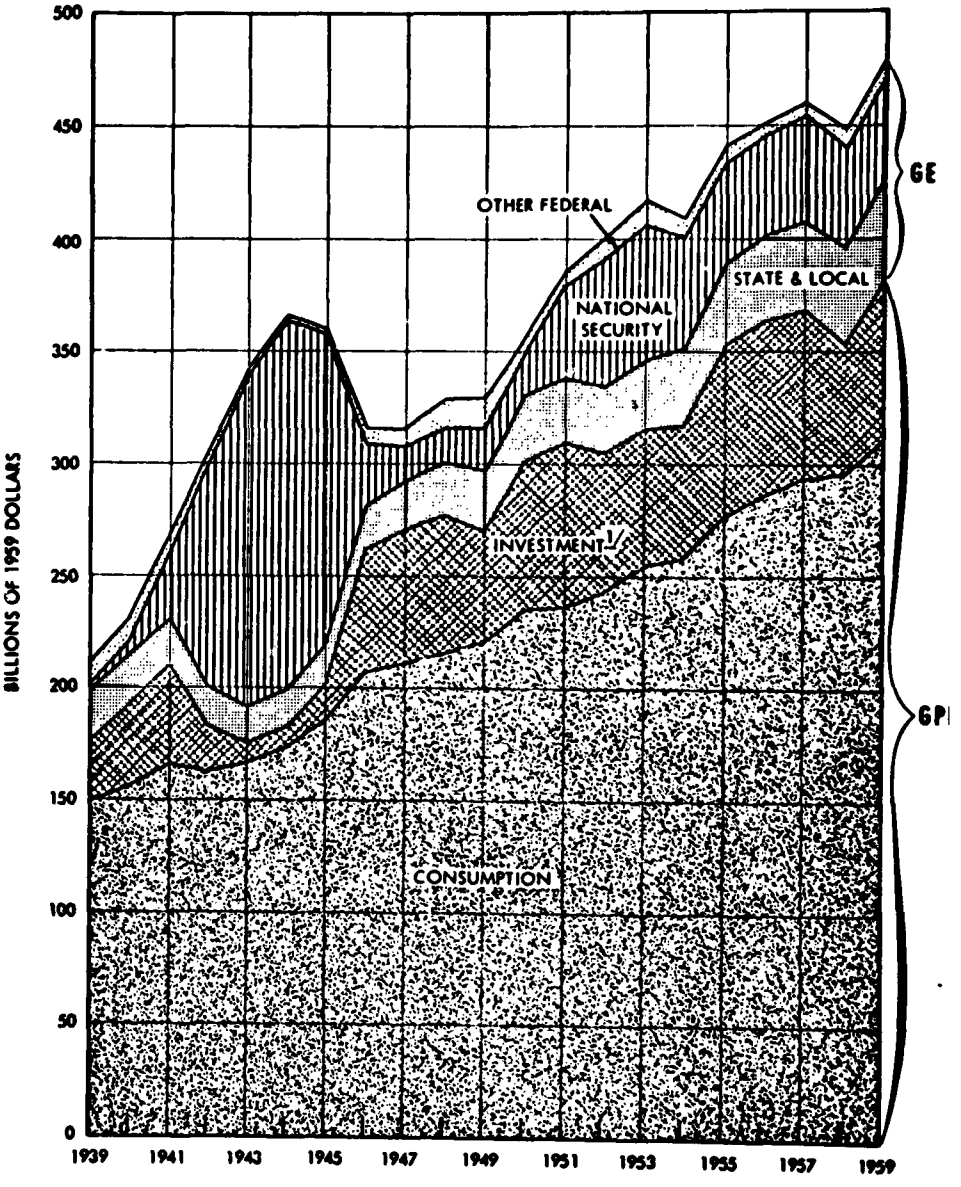
Year	Government Purchases of Goods and Services				
	(1) Total	Federal			(5) State Local
		(2) Total	(3) National Security 1/	(4) Other	
1929	$ 22.4	$ 3.6	$ n.a.	$ n.a.	$18.8
1930	24.7	4.1	n.a.	n.a.	20.7
1931	26.1	4.8	n.a.	n.a.	21.6
1932	24.8	4.7	n.a.	n.a.	20.1
1933	24.1	6.4	n.a.	n.a.	17.7
1934	27.5	8.4	n.a.	n.a.	19.2
1935	27.8	8.1	n.a.	n.a.	19.7
1936	32.5	12.4	n.a.	n.a.	20.1
1937	31.4	11.7	n.a.	n.a.	19.8
1938	34.9	13.9	n.a.	n.a.	21.0
1939	36.5	13.3	3.2	10.1	23.1
1940	37.7	15.9	8.7	10.2	21.8
1941	57.7	37.2	30.2	7.0	20.5
1942	121.2	102.5	97.3	5.3	18.7
1943	166.9	149.9	147.2	2.7	17.0
1944	184.2	167.6	164.7	2.9	16.7
1945	158.8	141.8	139.8	1.9	17.0
1946	83.2	34.1	26.7	7.4	19.0
1947	45.0	23.4	15.3	8.1	21.5
1948	50.9	27.7	15.9	11.8	23.2
1949	57.1	30.6	18.4	12.2	26.5
1950	54.6	26.2	19.1	7.0	28.4
1951	76.6	47.5	41.1	6.4	29.1
1952	94.1	64.5	56.3	8.2	29.6
1953	102.0	71.1	60.1	11.0	30.9
1954	91.1	57.6	49.5	8.1	33.5
1955	88.6	52.7	45.0	7.6	35.9
1956	87.5	50.5	44.2	6.3	37.0
1957	90.9	51.8	46.1	5.8	39.0
1958	94.9	53.3	45.0	8.3	41.6
1959	97.9	53.6	45.5	8.1	44.3

1/ The classification of "national security expenditures" in the national product accounts corresponds closely to the definition of "major national security" in the Budget of the United States Government for the Fiscal Year Ending June 30, 1961. The major purchase categories included are: defense (including foreign military assistance), atomic energy activities, and stockpiling and defense production expansion.

Source: Economic Report of the President, 1960, Table B-2.

FIGURE 1

GROSS NATIONAL PRODUCT: GOVERNMENT AND PRIVATE EXPENDITURES
1939 - 1959



1/ Includes Net Exports.

SOURCES: Tables I and II.

supply even the prodigious war requirements of the federal government, yet leave for private use almost as large an average annual amount as had been available to the private economy in 1940, the year the defense program was launched. Private expenditures in 1940 absorbed $192 billion of the national output (Table I), while during 1941-44 the average was $187 billion, a reduction of less than 3 percent. Thus, the increase in GNP was only a trifle less than the increase in government expenditures on goods and services (GE). The reduction of private expenditures, extremely modest when averaged for the period as a whole, was somewhat more marked by 1943. In that year they were, at $175 billion, 9 percent below the 1940 level. The situation improved in 1944, when government expenditures, increasing less rapidly than in earlier years, were outstripped by the expanding GNP, so that private expenditures rose to $182 billion, only 5 percent below 1940.

In 1944, government expenditures, in 1959 dollars, were 80 percent as large as the entire gross national product had been in 1940. Because of the marked expansion of GNP during this period, however, the fraction represented by GE, in terms of current prices, increased from only 14 percent in 1940 to 46 percent in 1943 and 1944.

During the Korean war period, 1950-53, government expenditures approached one-quarter of GNP (22.7 percent in current prices) rather than almost one-half, as in 1944. GNP increased $61 billion, as GE rose $47-1/2 billion and private expenditures increased $13-1/2 billion, in 1959 dollars.

The relevant data drawn upon for these comparisons are shown in Tables III and IV and summarized in Table V. It is important, in appraising the apparent relationship between the increase of government expenditures and expansion of the gross national product, not to overlook the complexity of the actual economic pattern of which these developments, although key parts, do not constitute the whole.

Two examples will suffice. In terms of annual totals, the government expenditures accompanying the Korean war first rose in 1951, the total actually having been slightly lower in 1950 than in 1949. Yet the increase in the fourth quarter of 1950, although modest, was accompanied by a sharp expansion of private spending on investment. This expansion can be accounted for only in terms of the prospect for the continued expansion of defense spending. This interpretation is underscored by the fact that, from 1951 through 1959, there have been only two quarters in which total domestic investment expenditures have approximated (in stable prices) the dollar total recorded for the fourth quarter of 1950. Accordingly, in making annual comparisons it would seem necessary to make 1949

Table III

GROSS NATIONAL PRODUCT, GROSS PRIVATE EXPENDITURES, GOVERNMENT EXPENDITURES AND COMPONENTS 1939-1959

(Billions of Current Dollars)

Year	(1) Gross National Product	(2) Gross Private Expenditures	Government Expenditures				
			(3) Total Government	Federal			(7) State & Local
				(4) Total Federal	(5) National Security[1/]	(6) Other	
1939	$ 91.1	$ 77.8	$13.3	$ 5.2	$ 1.3	$3.9	$ 8.2
1940	100.6	86.5	14.1	6.2	2.2	4.0	7.9
1941	125.8	101.0	24.8	16.9	13.8	3.2	7.8
1942	159.1	99.4	59.7	52.0	49.4	2.7	7.7
1943	192.5	103.9	88.6	81.2	79.8	1.5	7.4
1944	211.4	114.9	96.5	89.0	87.4	1.6	7.5
1945	213.6	130.7	82.9	74.8	73.7	1.0	8.1
1946	210.7	180.2	30.5	20.6	16.1	4.5	9.9
1947	234.3	205.9	28.4	15.6	10.3	5.4	12.7
1948	259.4	224.9	34.5	19.3	11.1	8.2	15.2
1949	258.1	217.9	40.2	22.2	13.4	8.9	17.9
1950	284.6	245.6	39.0	19.3	14.2	5.2	19.7
1951	329.0	268.5	60.5	38.8	33.6	5.2	21.7
1952	347.0	271.0	76.0	52.9	46.1	6.7	23.2
1953	365.4	282.6	82.8	58.0	49.0	9.0	24.9
1954	363.1	287.8	75.3	47.5	40.9	6.7	27.7
1955	397.5	321.9	75.6	45.3	38.7	6.6	30.3
1956	419.2	340.2	79.0	45.7	40.1	5.7	33.2
1957	442.5	356.3	86.2	49.4	43.9	5.5	36.8
1958	441.7	349.1	92.6	52.2	44.0	8.1	40.5
1959	478.8	380.9	97.9	53.6	45.4	8.1	44.3

Note: Column 3 obtained by subtracting column 2 from column 1. Totals do not necessari check out because of rounding.

1/ National security expenditures less "surplus" sales.

Source: Economic Report of the President, 1960, Table D-1, p. 188.

Table IV

GROSS PRIVATE EXPENDITURES, GOVERNMENT EXPENDITURES AND COMPONENTS
ALL AS A PERCENT OF GROSS NATIONAL PRODUCT
1939–1959
(Based on Current Dollars)

Year	(1) Gross National Product	(2) Gross Private Expenditures	Government Expenditures				
			(3) Total Government	Federal			(7) State & Local
				(4) Total Federal	(5) National Security	(6) Other	
1939	100.0%	85.4%	14.6%	5.7%	1.4%	4.3%	9.0%
1940	100.0	86.0	14.0	6.2	2.2	4.0	7.9
1941	100.0	80.3	19.7	13.4	11.0	2.5	6.2
1942	100.0	62.5	37.5	32.7	31.0	1.7	4.8
1943	100.0	54.0	46.0	42.2	41.5	0.8	3.8
1944	100.0	54.4	45.6	42.1	41.3	0.8	3.5
1945	100.0	61.2	38.8	35.0	34.5	0.5	3.8
1946	100.0	85.5	14.5	9.8	7.6	2.1	4.7
1947	100.0	87.9	12.1	6.7	4.4	2.3	5.4
1948	100.0	86.7	13.3	7.4	4.3	3.2	5.9
1949	100.0	84.4	15.6	8.6	5.2	3.4	6.9
1950	100.0	86.3	13.7	6.8	5.0	1.8	6.9
1951	100.0	81.6	18.4	11.8	10.2	1.6	6.6
1952	100.0	78.1	21.9	15.2	13.3	1.9	6.7
1953	100.0	77.3	22.7	15.9	13.4	2.5	6.8
1954	100.0	79.3	20.7	13.1	11.3	1.8	7.6
1955	100.0	81.0	19.0	11.4	9.7	1.7	7.6
1956	100.0	81.2	18.8	10.9	9.6	1.4	7.9
1957	100.0	80.5	19.5	11.2	9.9	1.2	8.3
1958	100.0	79.0	21.0	11.8	10.0	1.8	9.2
1959	100.0	79.6	20.4	11.2	9.5	1.7	9.3

Source: Table III.

Table V

COMPARISON OF INCREASES IN GOVERNMENT EXPENDITURES
AND GROSS NATIONAL PRODUCT
1940-1944 and 1950-1953[1]
(Billions of 1959 Dollars)

Year	(1) Government Expenditures	(2) Gross National Product	(3) GE as % of GNP[2]	Increase from Previous Year		Average Annual Increase from First Year		Ratio of GNP Increase to GE Increase	
				(4) GE	(5) GNP	(6) GE	(7) GNP	(8) From Previous Year (5)/(4)	(9) Cumulative (7)/(6)
1940	$ 37.7	$229.9	14%	$ —	$ —	$ —	$ —	—	—
1941	57.7	267.7	20	20.0	37.8	20.0	37.8	1.9	1.9
1942	121.2	304.1	38	63.5	36.4	41.8	37.1	0.6	0.9
1943	166.9	341.6	46	45.7	37.5	43.1	37.2	0.8	0.9
1944	184.2	366.3	46	17.3	24.7	36.6	34.1	1.4	0.9
1950	54.6	356.2	14	—	—	—	—	—	—
1951	76.6	385.0	18	22.0	28.8	22.0	28.8	1.3	1.3
1952	94.1	399.0	22	17.5	14.0	19.8	21.4	0.8	1.1
1953	102.0	417.1	23	7.9	18.1	15.8	20.3	2.3	1.3

1/ Cf. Table XI, in which the influence of time (i.e., "normal" growth) is eliminated.
2/ The ratios in column 3 are from current dollar figures; see Table IV.

Source: Economic Report of the President, 1960, Table B-2.

our base year, if we were to take full account of the impact of government expenditures during that period. On the other hand, it would be a serious mistake to attribute entirely to government expenditures the expansion of gross national product by an amount double that of the increase in government expenditures (which is the relationship if the comparison is made from 1949). For 1949 was a year of recession, and a significant part of the expansion of GNP presumably would have occurred even in the absence of an increase of government spending.

The other example relates to the years following 1929 (see Table I). Between 1929 and 1933, gross national product, even in stable prices, declined each year. Yet government expenditures increased in 1930 and 1931, and the moderate reduction during the next two years left the total higher than in 1929. It is apparent, therefore, that, whatever the contribution of government expenditures may be, there is no simple relationship between them and gross national product that can be applied, regardless of circumstances, to arrive at an end result. It must be borne in mind in this connection, however, that government expenditures in 1929 accounted for only 11 percent of gross national product. Moderate changes in so modest a fraction of the total must be expected to be much less significant than massive changes which rapidly bring the fraction up into the range of 25 to 50 percent of total output.

Impact of Government Spending

Table V presents data for the years 1940-44 and 1950-54, with the increases in GE and GNP for each of these periods shown both annually and averaged from the first year. This is helpful in understanding the impact of government spending on national output during both the recent wartime periods.

The comparisons disclose that for the World War II period, the initial increase of government spending was accompanied by an expansion of nearly double the same dollar amount in gross national product. Thus, the government share of GNP increased to only 20 percent in 1941. In the years that followed, this share itself more than doubled, to approximately 46 percent in 1943 and 1944. As the government fraction increased, the annual ratio of the increase in GNP to the increase in GE moved erratically. In 1942 and 1943 it was much lower than in 1941, while in 1944, the government fraction having risen to 46 percent, the ratio nonetheless was 1.4. These swings reflect, of course, not only the impact of government spending but also all the other factors that affected the course of the economy during the period. When the increases of gross national product on the one hand, and of government expenditures on the

other, are averaged out, we find that after 1941 the ratio of GNP to GE increases is more stable, running during 1942-44 at 0.9 or somewhat less. As this ratio implies, GPE contracted somewhat as GE rose.

This "belt tightening" in 1942 and 1943 was concentrated in the investment sector. The volume of consumption expenditures increased each year throughout the period, with the sole exception of 1942. The decrease of 2 percent in that year was followed by a rise that carried consumption, measured in 1959 dollars, to a new high in 1943. This temporary reduction of consumption aside, the belt tightening took the form of a cut of $25 billion a year in gross private domestic investment spending, from $43 billion in 1940 to less than $18 billion, on the average, in 1942-45. During the same period, net exports of $1.9 billion were replaced by net imports averaging $4.5 billion, representing an average increase of nearly $7 billion on goods and services made available to the U.S. economy each year through foreign trade.

After 1945, the domestic investment requirements that had been deferred during the war years contributed to an upsurge of investment that brought the average for 1946-50 to $54 billion, 25 percent above the previous peak. Meanwhile, exports once more came to exceed imports by an annual average of $4-1/2 billion.

Thus, owing to the deferability of domestic private investment and to adjustments in foreign trade, total American consumption during the war was not adversely affected by the tremendous increase in government demand. The per capita consumption of civilians did decline slightly from 1941 to 1942 (Table VI), but 1941 and 1943 showed unusually high one-year increases, and the annual average increase from 1940 to 1944 was 3.5 percent, more than double the long-term average.

Gross private expenditures, investment, consumption expenditures, and per capita consumption, during the war years are illustrated in Figure 2.

Two other qualifications need also be borne in mind. The reduction of private investment was partially offset by the large amount of investment included in government expenditures, some of which had postwar civilian usefulness. There was also a corresponding deferral of consumers' investment in durable goods and housing; in other words, the increase in actual current personal consumption was greater than the increase in personal spending, as, in part, the consumer "lived on his capital." Finally, it must be noted that such deferral, particularly that of business investment, could not have been continued indefinitely without seriously affecting the national output.

Table VI

CONSUMPTION PER CAPITA
1939-1959 and Estimated 1960
(1959 Dollars)

Year	(1) Consumption Expenditures (billions)	(2) Civilian Population (millions)	(3) Civilian per Capita Consumption[1/]	(4) Annual Rate of Growth in Consumption per Capita	(5) Average Annual Rate of Growth
1939	$148.3	130.7	$1,135		
1940	156.3	131.6	1,188	4.7%	
1941	166.7	131.8	1,265	6.5	
1942	162.9	130.9	1,244	-1.7	3.5%
1943	167.2	127.7	1,309	5.2	
1944	173.1	127.0	1,363	4.1	
1945	185.2	128.5	1,441	5.7	
1946	207.8	137.9	1,507	4.6	
1947	211.4	142.5	1,484	-1.5	
1948	215.4	145.2	1,483	-0.1	
1949	220.9	147.6	1,497	0.9	
1950	234.5	150.0	1,563	4.4	
1951	236.4	151.3	1,562	-0.1	1.4%
1952	242.5	153.4	1,581	1.2	
1953	254.2	156.1	1,628	3.0	1.5%
1954	257.5	159.1	1,618	-0.6	
1955	277.0	162.2	1,708	5.6	
1956	286.0	165.3	1,730	1.3	
1957	293.1	168.4	1,740	0.6	
1958	295.9	171.4	1,726	-0.8	
1959	311.4	174.7	1,782	3.2	
1960 est.	320	177.2	1,806	1.3	

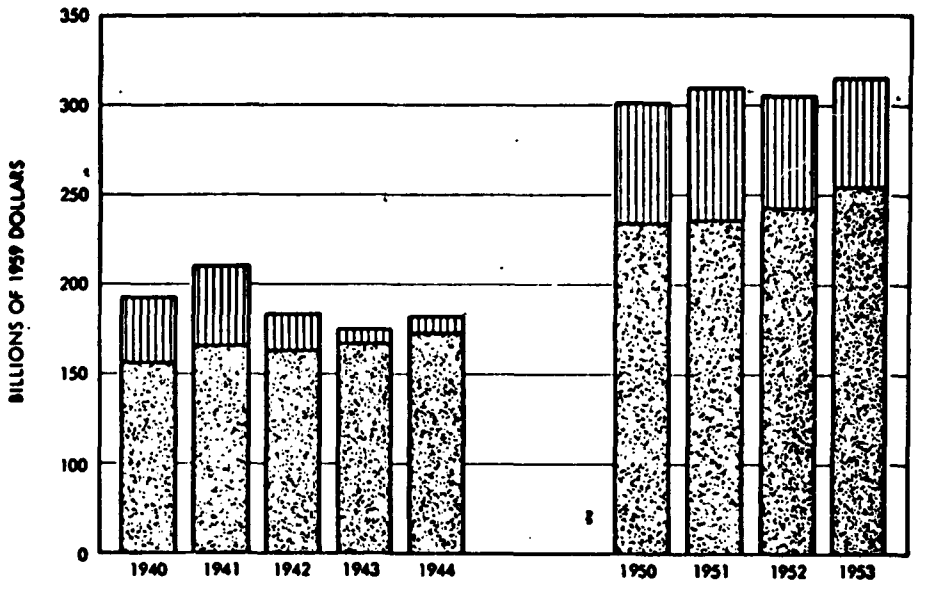
1/ Per capita figures are higher than those published in Economic Report of the President, 1960, p. 136, as all Armed Forces are excluded in this tabulation in order to measure trends for the private sector. This exclusion has the effect of increasing the rate of growth of per capita consumption during war years, when a larger proportion of the total population is in the Armed Forces, and decreasing the rate of growth during the immediate postwar years.

Sources: Column 1, Table I. Column 2 (1939-57) from Bureau of the Census, as published in The Economic Almanac, 1958 published for the National Industrial Conference Board by Thomas Y. Crowell Company, pp. 1 and 326; 1958-59 figures from Survey of Current Business, U.S. Dept. of Commerce, February 1959, p. S-11, and March 1960, p. S-11.

FIGURE 2

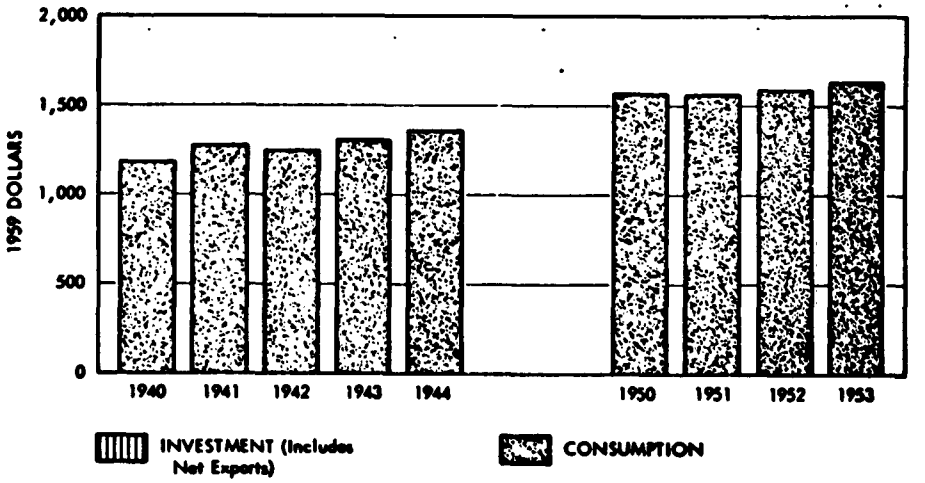
INVESTMENT AND CONSUMPTION
1940 - 44 AND 1950 - 53

GROSS PRIVATE EXPENDITURE



SOURCE: Table I.

CIVILIAN PER CAPITA CONSUMPTION



SOURCE: Table XI.

The statistical evidence of increased consumption during 1940-44 occasionally arouses doubts, particularly among those who remember the taxation and the rationing of the period. On a total or a per capita basis, of course, the increase of consumption affected different income and occupational groups differently, just as some citizens improved their living standards on entering the armed services, while many experienced deprivation. Not everyone shared in the increases, and many whose consumption increased only modestly may have been more aware of increased taxation and of restrictions on the spending of after-tax income than of the fact that their net position, objectively measured, had improved. Moreover, the effect on the average privately employed person was not the same as that on the average member of the population. Private employment, 1940-44, increased from 47.5 to 54.0 million, so that consumption per private employee declined slightly from $3290 to $3210 or 0.6 percent a year; for many, the decline was undoubtedly much more significant.

The tendency of increases in government spending to be reflected in matching, or greater, increases of GNP, when the fraction of total output taken by government was less than 25 percent, was again evident during the Korean war period. At that time, the initial increase was accompanied by an expansion of GNP nearly one-third again as large, while the government fraction of total output was raised only to 20 percent by 1951. During the balance of the period, although the government fraction increased to almost 25 percent, the average annual increase of GNP remained above the average annual increase of GE. In year-to-year terms, also shown in Table V, the ratio between the increases varied widely.

In light of these comparisons, we may conclude that the tendency in recent experience has been for an expansion of government spending to be accompanied by a greater increase in GNP until the total of such expenditures has reached some fraction greater than 25 percent of gross national product. When the fraction has approached 50 percent, increases of government expenditures have tended to be less than fully matched by expansion of gross national product. When this has occurred, however, the deficiency has been remedied, so far as gross private expenditures are concerned, by deferment of investment and by a temporary excess of imports.

It is worth emphasis that even our experience during World War II did not constitute an example of government expenditures so greatly expanded that more than a small portion of the increase had to be gained at the expense of the private economy--including here investment as well as consumption--rather than from the increase of total output. In a very real sense, therefore, the expansibility of the government sector of the U.S. economy has never been fully tested. If a limit was approached, it was a political, not an economic limit.

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Findings

To recapitulate: Three observations from our recent wartime experiences are (1) in both periods a marked increase of government expenditure was accompanied by a comparable increase of gross national product; (2) until such increases were carried to the point where expanded government spending took something more than one-quarter of the expanded gross national product, the increase of GNP indeed exceeded that of GE (so that, in terms of current output, the government expansion was cost-free); and (3) as the fraction of GNP taken by government approached one-half, the associated expansion of GNP diminished to slightly less than the increase in GE.

Having drawn these inferences from the statistics of two wartime periods, we now ask--might similar consequences be expected, if government expenditures were again to be markedly expanded? In arriving at an answer, we must supplement our reading of the facts of two historical periods with the insight provided by economic theory. Very simply, is the behavior we have described consistent with theory? Does generally accepted theory provide an explanation that will support the conclusion that similar behavior may be expected of the economy if pressing needs once more demand rapid expansion of government expenditures? These questions will be answered in Chapter 3.

Chapter 3

ANALYTICAL EXPLANATION OF WARTIME EXPANSION

It is essential at the outset to understand that we are considering here the effect of increased government expenditures on the behavior of a dynamic, expanding economy. We are not concerned with stemming a depression, nor with getting the economy on the upgrade from the depths of one, but with influencing the volume of output to increase more rapidly than the long-term trend. We start with this upward trend in over-all activity--reflecting among other factors the steady growth of population, the less steady but seldom interrupted growth of the stock of productive plant and equipment, and the secular improvement of productive efficiency. And our objective is to examine whether an expansion of government expenditures during the 1960's may be expected to produce results similar to those accompanying the expansions that followed 1940 and 1950.

The Significance of Excess Productive Capacity

One important consequence of the upward trend of economic activity is the increase of the productive capacity of the economy, capacity that is kept ahead of output and is seldom brought into full use even during periods of sharpest expansion. The persistence of reserve capacity is universally acknowledged, so that it requires little specific examination here, but its significance for the present study must be understood.

Unfortunately, there is no unambiguous definition of capacity, much less a satisfactory measure of it. The problem is simply illustrated by the example of a plant that has a given capacity if operated 8 hours a day, but which could be operated 24 hours a day if circumstances required a maximum effort. Which daily output should be regarded as measuring the true capacity? And should annual capacity reflect 260 days or something close to 365 days of operation?

In dealing with this general problem in connection with policy issues arising under the Employment Act of 1945, the staff of the Joint Economic Committee has in recent years developed an extremely useful concept of "potential output." No attempt is made to measure the capacity of the economy in any sense of the total output that could conceivably be produced with the resources of manpower, plant, and technology at hand. Instead, a much lower total, that of potential output, is estimated in terms of reasonably efficient use of capacity.

> . . . For each year, 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 men can do under the usual operating conditions maintainable over long periods of time [either] without excess strain or breakdown . . . excessive, wasteful slack in the system, particularly prolonged, involuntary unemployment of labor.1/

The committee staff's analysis of economic growth, in terms of potential output as thus defined, has recently been extended to the period 1909-60, with projection to 1975 under three alternative sets of assumptions.2/ With respect to the historical record, this analysis represents a carefully articulated method of taking account of all the principal factors that are recognized as determining potential output. The projections based upon it are correspondingly useful for testing the consistency of other GNP projections with assumed continuance of the observed historical relationships reflected in potential output as thus defined.

The Joint Economic Committee study indicates that between 1909 and 1959, apart from the World War II years, actual gross national product approximated as much as 107 percent of potential GNP only in 1912 and 1918 (see Figure 3). Only during 1943-45, moreover, when the excess of output above potential is estimated to have reached 13 to 18 percent (the peak coming in 1944), can it be said that full capacity operation was being approached.3/ This characteristic of the 1943-45 period is consistent, of course, with the diminished effect on GNP of increasing GE after

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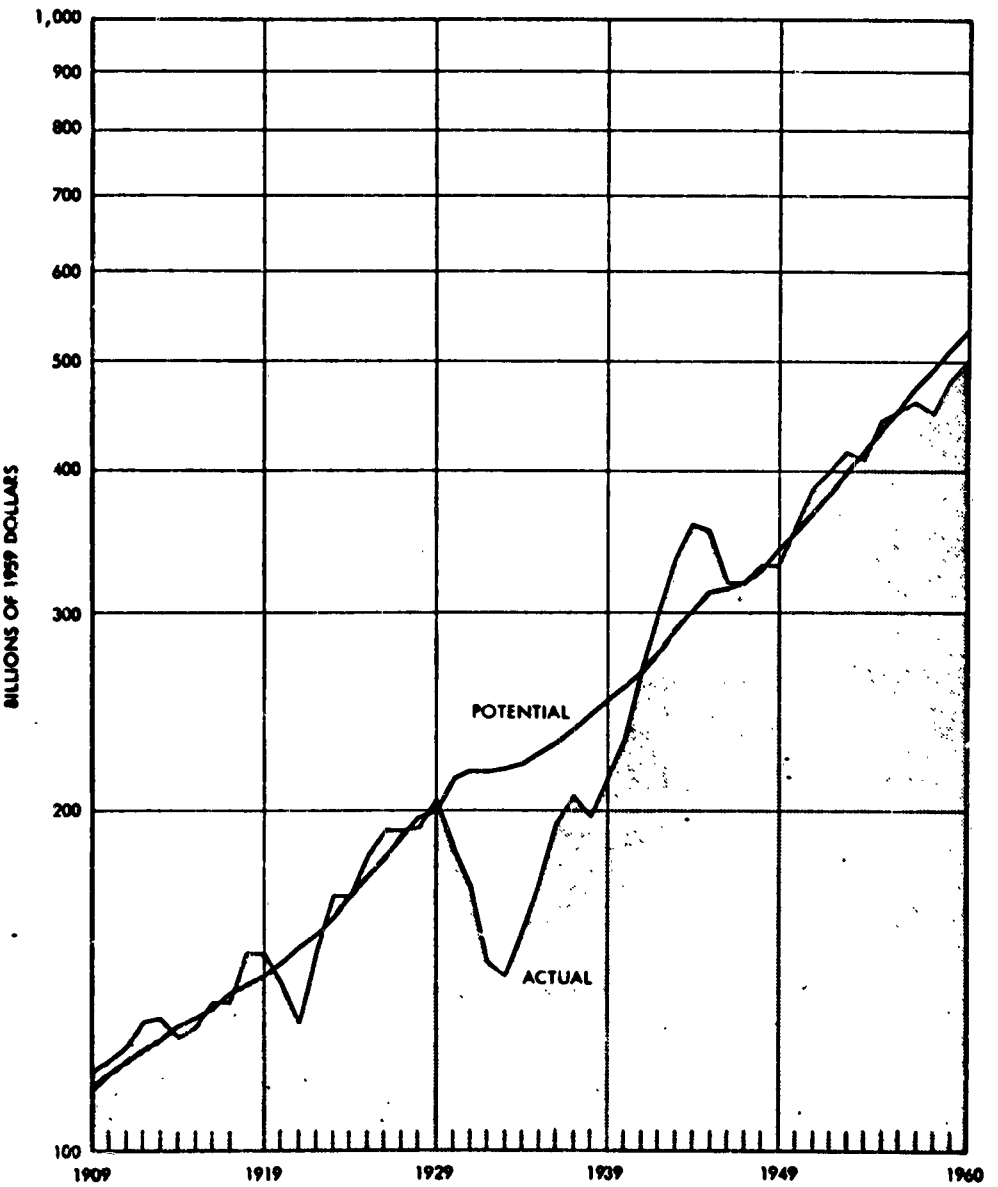
1/ James W. Knowles, The Potential Economic Growth of the United States, Study Paper No. 20, U.S. Congress, Joint Economic Committee, 86th Congress, 2nd Session, January 30, 1960, pp. 7-8 (underscoring represents italics used in the source). The measure of potential developed takes account of the following factors: labor force, employment, average annual hours of work per employee, gross tangible capital stock, average age of capital stock, and a "mix factor" for productivity of labor and capital.

2/ Ibid., pp. 36-44.

3/ Ibid., Table 2, p. 37.

FIGURE 3

ACTUAL AND POTENTIAL GROSS NATIONAL PRODUCT
1909 - 1959



SOURCE: Calculated from Knowles, James R., op. cit.

1941, which we have already noted. More importantly, it is this demonstrated margin between potential output and genuinely full capacity operation that explains how it is possible for even a very sharp expansion of total demand to bring forth matching output.

It may be [illegible] fully just [illegible] greatly [illegible] this tre[illegible]t (including those in the Armed Forces) and in the average number employm[illegible] worked by civilians. of hours

Tota[illegible] employment rose from 48.1 million in 1940 to 65.4 million in 1944, or by 36 percent (see Tables VII and VIII). Average weekly hours [illegible]eased from 44.0 to 47.8 during the same period, meantime having worked inc[illegible]k of 48.5 in 1943 (see Figure 4). In combination, these two reached a pe[illegible]led an increase of roughly 48 percent in total hours employed, factors yiel[illegible]tive assumption being made that those in the Armed Forces were the conserv[illegible]same number of hours per week as were civilians. Since real employed t[illegible]onal product increased by about 59 percent between 1940 and 1944, gross nat[illegible]ar that merely the rise in man-hours of employment, with unchanged it is cle[illegible]ity per hour, could have accounted for the great bulk of the increase i[illegible] output.

While a substantial portion of the increase of more than 17 million in tot[illegible]om over 8 million to about half a million, this is by no means [illegible] even most, of the story. For the total labor force (those working al[illegible] looking for work, including members of the Armed Forces) rose by almost 10 million during this period. Population growth, moreover, accounted for only a minor portion of this increase. In 1940 the labor force constituted 55.3 percent of the population over 14 years of age. By 1944 this ratio had increased to 62.0 percent. If the 1940 ratio had continued, the 1944 labor force would have been only about 58.9 million, instead of 66 million, as was actually the case.

The fact that so great an increase in the effective supply of labor could be obtained during World War II years, as total demand increased, demonstrates how substantial a degree of slack may exist in the economy at a given time. In terms of the Knowles analysis, this slack amounted to 15 percent below potential in 1939 and to 10 percent in 1940. As already noted, actual output reached 118 percent of ordinary potential in 1944; between 1940 and 1944 this potential itself increased 18 percent.

Table VII

GOVERNMENT EXPENDITURES, LABOR FORCE, EMPLOYMENT, AND HOURS
1939-1959

Year	Government Expenditures (billions of 1959 dollars)	(2) Total Labor Force (millions)	(3) (Civilian Employment plus Armed Forces) (millions)	(4) Percent of Employment 1/	(5) Percent of Unemployment	Average Weekly Hours of Work 2/
1939	$ 36.5	55.6	46.1	82.9%	17.1%	n.a.
1940	37.7	56.2	48.1	85.6	14.4	44.0
1941	57.7	57.5	52.0	90.4	9.6	44.7
1942	121.2	60.4	57.7	95.5	4.5	46.3
1943	166.9	64.6	63.5	98.3	1.7	48.5
1944	184.2	66.0	65.4	99.1	0.9	47.8
1945	158.8	65.3	64.3	98.5	1.5	46.1
1946	53.2	61.0	58.7	96.2	3.8	44.3
1947	45.0	61.8	59.4	96.1	3.9	43.5
1948	50.9	62.9	60.6	96.3	3.7	42.8
1949	57.1	63.7	60.0	94.2	5.8	42.1
1950	54.6	64.7	61.4	94.9	5.1	41.7
1951	76.6	66.0	63.9	96.8	3.2	42.2
1952	84.1	66.6	64.6	97.0	3.0	42.4
1953	102.0	67.4	65.5	97.2	2.8	41.9
1954	91.1	67.8	64.2	94.7	5.3	40.9
1955	88.6	68.9	66.0	95.8	4.2	41.6
1956	87.5	70.4	67.6	96.0	4.0	41.5
1957	90.9	70.7	67.8	95.9	4.1	41.0
1958	94.9	71.3	66.6	93.4	6.6	40.6
1959	97.9	71.9	68.1	94.7	5.3	40.5

1/ Columns 4 and 5 are calculated from columns 2 and 3 and do not precisely equal the more often quoted percentages published by BLS figures, though nearly the same.
2/ Agricultural and nonagricultural industries combined.

Sources: Column 1, Table I.Columns 2 and 3, Economic Report of the President, 1960, Table D-17; column 6, National Planning Association, National Economic Projections, 1960, Table 17; 1952-58 figures, U.S. Dept. of Commerce, Current Population Reports, Series P-50, Annual Report on the Labor Force, 1952-1958.

Table VIII

SOURCES OF GROWTH (1): WARTIME EXPERIENCE
SUMMARY OF EMPLOYMENT AND PRODUCTIVITY FACTORS - WORLD WAR II AND KOREA

Growth Factor	World War II			Korea		
	(1) 1940	(2) 1944	(3) Average Annual Rate of Change	(4) 1950	(5) 1953	(6) Average Annual Rate of Change
Employment						
1. Population over 14 (millions)	101.6	106.6	1.3%	113.0	116.8	1.1%
2. Labor force participation rate	55.3%	62.6%	—	57.3%	57.8%	—
3. Labor force (millions)	56.2	66.0	4.1%	64.7	67.4	1.4%
4. Employment rate	85.6%	99.1%	—	94.6%	97.2%	—
5. Employment (millions)	48.1	65.4	8.0%	61.4	65.5	2.2%
Productivity						
6. Output per man-hour	$2.09	$2.36	1.9%1/	$2.65	$2.90	3.0%1/
7. Average weekly hours	44.0	47.02/	2.1%	41.7	41.0	0.2%
8. Output per employee (annual)	$4,780	$5,601	4.0%1/	$5,961	$6,368	2.2%1/
Gross National Product						
9. Real gross national product (billions of 1959 dollars)	$220.9	$306.3	12.4%3/	$356.3	$417.1	5.4%

1/ These productivity increases are low because the employment factor includes government employment, which went up drastically, primarily because of the draft. Taking private employment only, and gross private product (GPP, equal to GNP less government wages and salaries), the figures become those given below. Private employment was computed by deducting Armed Forces and government employment from the total employment figure in Table VIII (see Tables D-17 and D-22 in <u>Economic Report of the President</u>, 1960). Gross private product is given in 1954 dollars in Table D-4 (<u>ibid.</u>). We have estimated it in 1959 dollars by deflating the 1954 government product (GNP - GPP) by the deflator for government purchases of goods and services in Table D-5 (<u>ibid.</u>) since no separate deflator is available for government product alone. This may introduce an error, but the effect on GPP will be very small and on trends for GPP will be negligible.

	World War II			Korea		
	(1) 1940	(2) 1944	(3) Average Annual Rate of Change	(4) 1950	(5) 1953	(6) Average Annual Rate of Change
5. Private employment	43.3	47.9	2.6%	53.7	56.3	1.6%
6. Output per man-hour	$2.09	$2.44	4.3	$2.70	$3.10	3.6
8. Output per employee	$4,772	$6,084	6.1	$6,020	$6,763	3.9
9. Gross private product (billions of 1959 dollars)	$206.6	$290.0	8.8	$323.7	$374.0	3.7

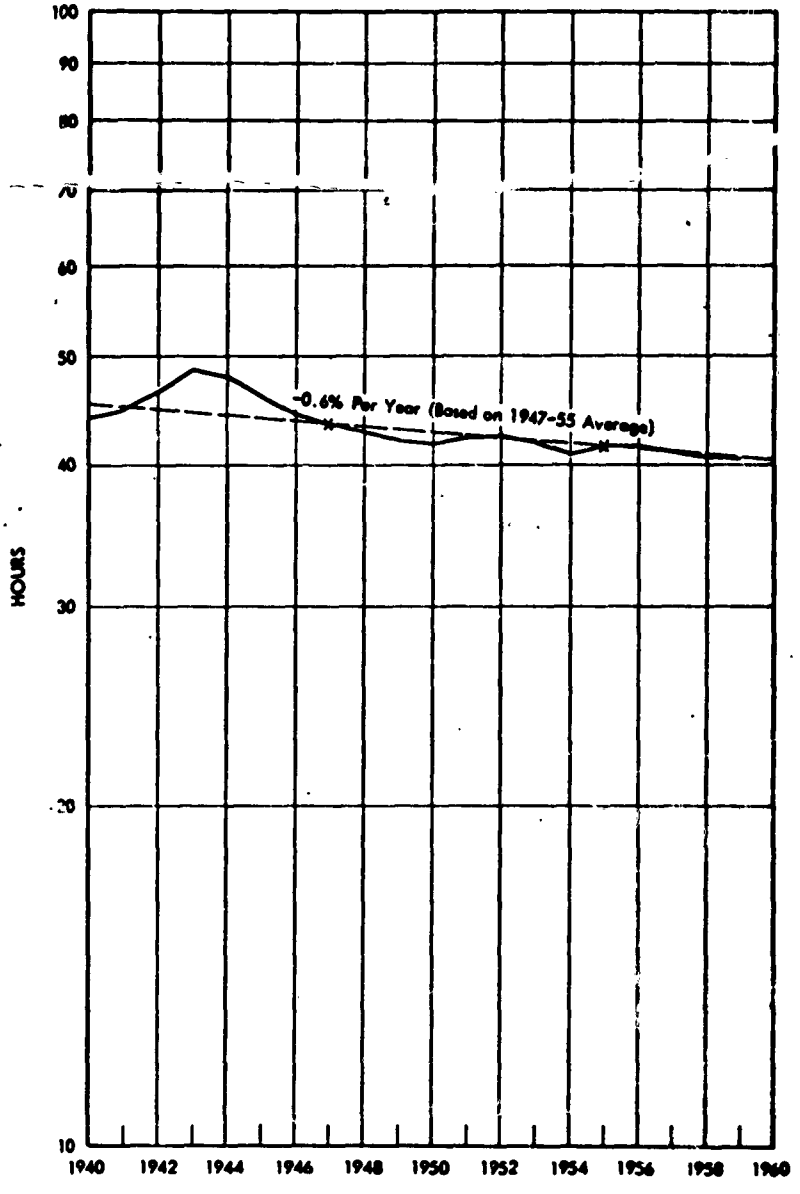
2/ Peak level was 48.5 in 1943.

3/ Percentages in lines 5 and 8 do not add up to that in line 9 because of "compound interest effect."

Sources: Line 1 from Bureau of the Census, as published in <u>The Economic Almanac, 1958</u>, published for the National Industrial Conference Board by Thomas Y. Crowell Company, p. 324. Lines 3 and 5 from Table D-17 and line 9 from Table D-3, <u>Economic Report of the President</u>, 1960. Line 7 from Table VII, column 6, above. Lines 2, 4, 6, and 8 are computed.

FIGURE 4

AVERAGE WEEKLY HOURS WORKED BY AGRICULTURAL AND NONAGRICULTURAL WORKERS
1940 - 1959



SOURCE: Table XII.

The Korean war period provides evidence of a different type of slack. During the years 1950 to 1953, the increase of 17 percent in real gross national product was accompanied by an increase of only 6.7 percent in total employment. The principal slack taken up was the reduction of 1.4 million in unemployment, thus constituting one-third of the 4.2 million increase of employment. Most of the rest of the increase is attributable to the growth of the labor force in pace with population. This was reinforced to a negligible extent by longer weekly hours of work, so that about three-fifths of the expansion of output must be attributed to rising productivity and other factors apart from increased use of labor. The relative contributions of these various factors making for growth in GNP during the two war periods are illustrated in Figure 5.

Had expansion been continued after 1953, we may conjecture that more and more plants would have been put on double and triple shifts, perhaps matching the 1942-44 performance, and that this would have resulted in greater use of the potential labor supply as well.

The point of significance for the present study is that at the outset of both these periods of expanding government programs there was substantial slack in the economy quite apart from that made evident by the level of unemployment. Indeed, even in 1953, if we take the 1944 performance as our standard of comparison, there still remained very considerable unused productive capacity in the economy. The ratio of the labor force to the population over 14 stood at 57.8 percent, 4.2 points below the 1944 ratio, while, despite reduction to less than 3 percent, unemployment still constituted more than double its 1944 percentage. The Knowles analysis offers corroboration on this point, rating 1953 output only 4 percent above the economy's potential, less than one-quarter the excess attained in 1944.

The Leverage of Increased Government Expenditures--The Multiplier[1/]

We have observed that both after 1940 and after 1950 increases of government expenditures were markedly reflected in expansion of current

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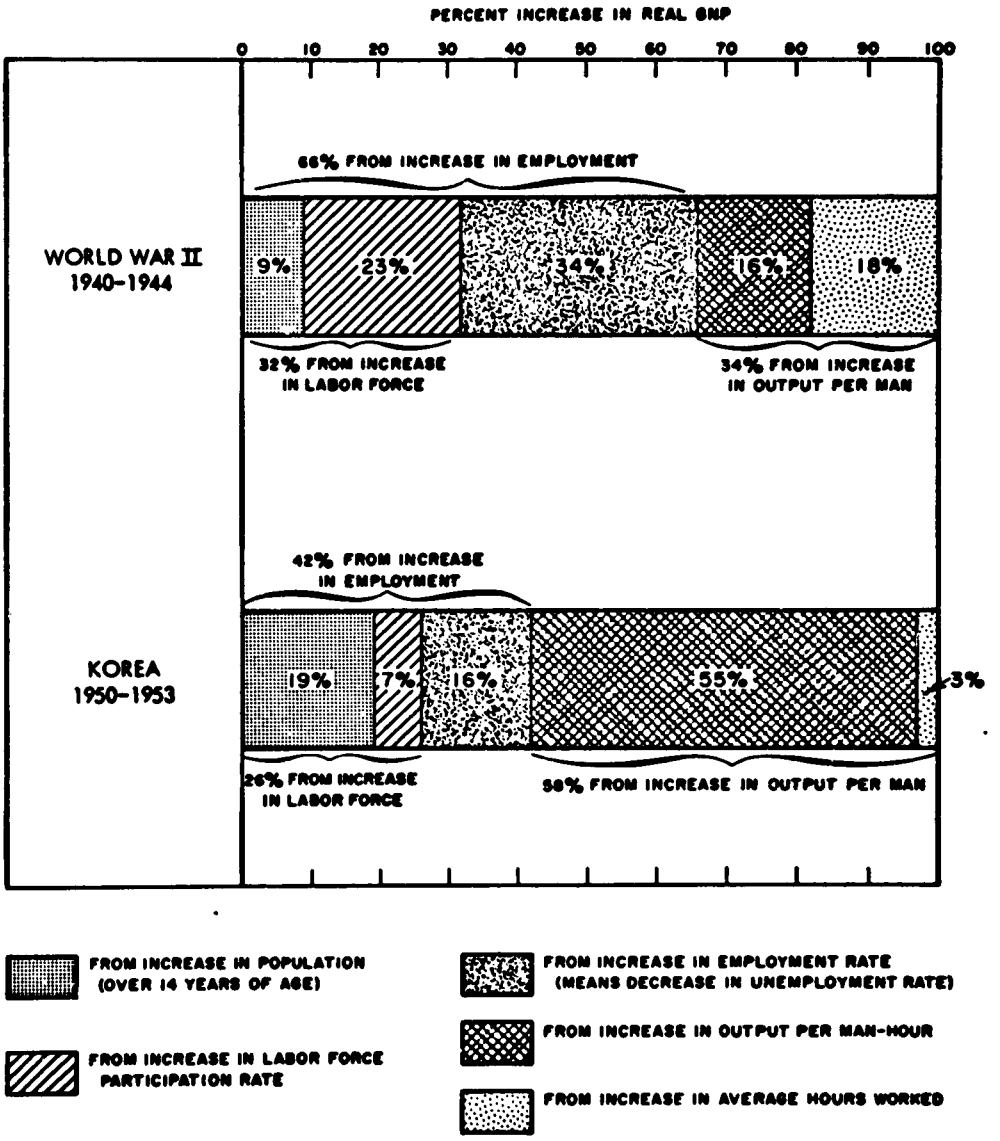
1/ The following discussion of the concept of the "multiplier" abstracts from two major factors which are apt to grow out of large increases in government expenditures: (1) speculative demand, both business and consumer, which is likely to accompany or even precede large government programs (particularly military programs, which usually lead to the popular expectation that "things will get worse before they

FIGURE 5

SOURCES OF GROSS NATIONAL PRODUCT GROWTH
1940 - 44 AND 1950 - 53



SOURCE: COMPUTED FROM TABLE VIII, BY METHOD GIVEN IN APPENDIX A.

national output. (The trends of GNP and its major components are summarized for the two periods in Table IX.) Subject to qualifications to be indicated below, increased government expenditures are likely to entail, quite immediately, even more than equal increases in demand. For when the government spends one dollar more in purchasing output, producers--unless they are already operating at full capacity, which is an extremely rare situation--add the dollar of increased output for the government to all their other output. But this means that they do not need to forego any income from other sources in order to acquire the government dollar; the dollar they receive from government is in addition to the income from all their other output.

There is no reason that this extra dollar from the government should be treated any differently from any other additional dollar of income. It is not likely to be saved; it will be spent on the same basis as any other additional income. If, for example, the recipients of the extra income from government are saving 1/3 of any increase of income and spending 2/3, we may expect 2/3 of this additional dollar to be spent. If so, this means an increase of total spending, of total demand, amounting to 2/3 of a dollar in addition to the original dollar of increased government demand.

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get better"); and, (2) on the other side of the ledger, government actions to dampen private demand. These factors will be considered in Chapter 4.

For fuller treatment of the multiplier concept, the reader is referred to:

James W. Angell, Investment and Business Cycles, New York: McGraw-Hill, 1941, pp. 189-210.

George Leland Bach, Economics, Englewood Cliffs, New Jersey: Prentice-Hall, 1960, pp. 182-192.

Robert A. Gordon, Business Fluctuations, New York: Harper & Bros., 1952, pp. 87-100.

Gottfried von Haberler, Prosperity and Depression, Cambridge, Mass.: Harvard University Press, 1958, pp. 222-232.

C. Lowell Harriss, The American Economy, Homewood, Illinois: Irwin, 1959, pp. 238-250.

Paul T. Homan, Albert Gailord Hart, and Arnold W. Samitz, The Economic Order, New York: Harcourt, Brace, & Co, 1958, pp. 458-461, 622-623.

Table IX

NATIONAL SECURITY EXPENDITURES AND GNP (1): WARTIME EXPERIENCE
WORLD WAR II AND KOREA
(Billions of 1959 Dollars)

	World War II					Korea				
	1940		1944		(5) Average Annual Increase	1950		1953		(10) Average Annual Increase
	(1) Amount	(2) Percent of GNP[1/]	(3) Amount	(4) Percent of GNP[1/]		(6) Amount	(7) Percent of GNP[1/]	(8) Amount	(9) Percent of GNP[1/]	
Gross National Product	$229.9	100.0%	$366.6	100.0%	12.3%	$356.2	100.0%	$417.1	100.0%	5.4%
Government Expenditures	37.7	14.0	184.2	45.6	48.7	54.6	13.7	102.0	22.7	23.2
Federal	15.9	6.2	167.6	42.1	80.2	26.2	6.8	71.1	15.9	39.5
National security	5.7	2.2	164.7	41.3	131.8	19.1	5.0	60.1	13.4	46.5
Other	10.1	4.0	2.9	0.8	-27.0	7.0	1.8	11.0	2.5	16.3
State and local	21.8	7.9	16.7	3.5	-6.4	28.4	6.9	30.9	6.8	2.9
Gross Private Expenditures	192.2	86.0	182.1	54.4	-1.3	301.6	86.3	315.1	77.3	1.5
Consumption	156.3	71.5	173.1	51.9	2.6	234.5	68.5	254.2	63.7	2.7
Investment	35.9	14.6	8.9	2.4	-19.4	67.1	17.8	60.9	13.7	-3.2

1/ Percentages of GNP are based on current dollars to avoid distortion caused by greater inflation of prices of goods and services purchased by government than by private sector.

Source: Stanford Research Institute, based on Economic Report of the President, 1960, Table D-2.

But, of course, if those who receive the 2/3 of a dollar spend, in turn, 2/3 of that 2/3, there is a further increase in demand, expenditure, and income, amounting to 4/9 of a dollar. If none of the government dollar had been spent by the original recipient and it had been entirely saved, there would, of course, have been no additional demand generated, and total expenditures would have increased by the amount of just one dollar. But if the "marginal propensity" of the community to consume is 2/3, so that only 1/3 of each additional dollar of income is added to savings, the effect of the dollar increase will continue, through additional spending, until 1/3 of the cumulative stream of additional spending finally amounts to one dollar, thereby bringing to a halt the effect of the initial increase. That is why the additional spending of 2/3 dollar, plus 4/9 dollar, plus 8/27 dollar, and so on up to a total of 2 dollars, brings the total increase to 3 dollars (out of which a total of 1 dollar is saved). Under circumstances where 2/3 is spent and 1/3 saved, the "multiplier" is 3. If 1/4 were saved, the multiplier would be 4, and so on.

This is, of course, a very simple model of the "pure" multiplier, which depends only on the propensity to consume. It must be qualified in many ways, but it is this process that underlies and provides major explanation for such developments as we have traced in the two war periods.1/

The Effective Multiplier

We have seen, then, the underlying theoretical explanation of the behavior of total demand when government demand rises sharply. A number of qualifications must be added, however, if the theory is adequately to clarify actual cases. First, we may note that a multiplier effect may result from increments of demand in other sectors of the economy as well. A rise in private investment has the same results. And an "autonomous" increase in consumption--an increase decided on by consumers, such as the heavy buying on credit of the popular 1955 autos, which is self-generated rather than simply reflecting the multiplier effect of demand in the government or investment sectors--is not essentially different, although it

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1/ The comparisons that have been made on the basis of annual averages between GNP and GE must not be taken as measuring the multiplier itself. These comparisons are intended simply to describe developments of the periods under study in terms that help relate them to the multiplier, the effect of which is disguised and distorted by many other factors also reflected in the totals.

may at times be more difficult to identify readily. We have considered here only the increased demand of government, because the overriding importance of government requirements in wartime leads to various means of governmental control over investment and consumption.

An increase in GE can have no apparent effect at all if it is swamped by a larger decrease in private investment spending (and even in consumer investment in "durables" subject to postponement, or, indeed, an autonomous decrease in consumer spending on nondurables), whether such a decrease occurs independently or as a related consequence of government policy. This is what happened between 1929 and 1932, when the increase of government expenditures was engulfed, 8-to-1, by the virtual disappearance of investment expenditures. At the other extreme, unless capacity exists to meet increases in demand, such increases may take effect in a rise of prices rather than additions to output. Further, the monetary supply must be sufficiently flexible that a "tightening" of money does not choke off other demand. More generally, the additional government expenditures may have the effect of decreasing other demand. Thus, new roads for trucks may decrease the demand of railroads for new freight cars. Offsetting such a decrease in the total of demand, new roads may generate demand for trucks, automobiles, service stations, motels, and the like. Furthermore, we should note that what is relevant is not the ultimate effect of one more dollar of government expenditures, but rather the effect, after any finite period of time, of an increased (and continued) rate of government expenditures. It is this we have examined, for the periods 1940-44 and 1950-53, in terms of annual averages.

With all such qualifications, however, it is generally agreed among economists that an increase in government demand, like an autonomous increase in private investment or consumption demand, will contribute, except insofar as other independent or related factors cancel it out, to a magnified increase in aggregate demand. The initial effect of either type of expenditure will be to increase consumption by increasing income.

The diminution of the apparent multiplier effect after 1941, as GE moved above 25 percent of GNP, may be interpreted as reflecting the effectiveness of the stabilization program in preventing the free spending of rising incomes. Spending by the general public was constrained by taxes and controls and, as the average fraction saved rose from 5-1/2 percent in 1940 to 25 percent in 1944, the "multiplicand" (i.e., the increase in GE minus the decrease in private investment) was kept in check. and the leverage of the multiplier was reduced. Were it feasible in time of war to raise taxes to match the increase of government spending, however, a similar multiplier of about one could be expected to result. At one time this was not understood, the view being widely held that an increase of

government spending that was matched by an equal increase of tax revenue would have no net effect on total income, demand, and output. Today, economists are agreed that under certain qualifying but quite reasonable assumptions, it can be shown that changes in government expenditures that are fully matched by tax changes will change total demand by precisely the amount of the change in government expenditures.

This "balanced budget multiplier" of one may be explained most simply by reminding ourselves again of the fact that individuals typically save a fraction of their income and spend the rest. If government expenditures, on the one hand, and taxes, on the other, are both increased by one dollar, what is the combined initial effect on total spending? Government spending is up by one dollar, while individual spending is down not by a dollar, but by only that fraction of the extra dollar gone for taxes that would otherwise have been spent. We could assume again that the fraction is 2/3, but perhaps the matter will be clearer if we take another proportion, say 4/5, or 0.8. In this case total spending is initially higher by 20 cents, which is the difference between the increase of one dollar in government spending and the reduction of 80 cents in individual spending that results from the payment of an additional dollar of taxes.

Now the increased spending of 20 cents constitutes a net increase of income for the producers of the goods and services that are initially affected. If they in turn spend 80 percent of any increase in income, there is now a further increase in spending of 80 percent of 20 cents or 16 cents. And so the series goes, as explained above--20 plus 16 plus 12.8 cents, and so on--until the increase of spending reaches a total out of which the saving of 20 percent of 1/5 will amount to the initial increase of income, 20 cents. This total, of course, is 5 times 20 cents, or one dollar. Thus, the original dollar of increased government expenditures, even though fully balanced by an increase of one dollar in taxes, generates an increase of one dollar in total spending and income. Furthermore, although it is improbable that an actual situation will be found in which the precise conditions prevail that will result in an exact 1-for-1 relationship, this ratio serves satisfactorily if relied on no more than as a rule of thumb and as a warning against assuming that a balanced budget increase has no multiplier effect at all.[1/]

1/ Writing in 1944, Hansen explained the effect of increased taxes to match an increase of expenditure as causing GNP to be "enlarged roughly by the amount of the new expenditure but not by a magnified amount." (a) Since that time this theorem has been subject to intensive examination and the introduction of many qualifications (see

Summary

It should now be clear that what happened in the two war periods is well explained in economic theory. If government expenditures are increased at a time when there is substantial reserve capacity--which is the usual case and was especially true in 1939-40--output may be expected to increase by more, and perhaps much more, than the increase of expenditures. (We exclude here the possibility of an engulfing depression.) Even if at this stage the increase of government expenditures is fully matched by taxes, a corresponding increase of output may be expected. As continued increase of expenditures, such as occurred following 1941, brings the economy significantly closer to capacity operations, the keener competition for resources will tend to diminish the effect, in real terms, of added government spending. The "balanced budget multiplier" sets a lower limit, however, so that even at relatively high levels of government demand and corresponding taxation, it must be expected that additional expenditures will bring forth additional demand of roughly matching amount. As such levels are approached and additional output entails rising costs, the pressure of demand will be increasingly inflationary. At whatever level it is determined that total demand must be stabilized, it will be necessary, as we have seen, to increase taxes by something more than the

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references below for partial list). In 1957, Salant, reviewing the issue comprehensively in light of a dozen years' discussion, was able, nonetheless, to conclude that "a balanced change in taxes and expenditures will always have some income-generating effect; the appropriate multiplier may be greater or less than one, depending on the model: The balanced budget theorem, while only an approximation of the truth (like any statement derived from simplified models), is a better approximation than the view it superseded, that . . . the balanced budget multiplier is zero." (f)

In 1958, defending his position, Salant conceded that "always" may have been too sweeping a word, "in view of the possibility that a sufficiently high import component in government expenditure might cause a negative income-generating effect." (h) In private correspondence he has explained that his general conclusion was, of course, "limited to the kinds of cases discussed in the paper, i.e., all expenditures [are] on currently produced goods and services, all taxes [are] personal income taxes, and only the simple functional relations mentioned in the paper [obtain] " In the 1958 article he summarized: "That core of truth, highly compressed, is that the effect on the level of income of a dollar of tax receipts cannot automatically

increase of government demand, if the objective is to be accomplished by fiscal means. More likely, some combination of controls will be called upon to limit the effective multiplier.

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be treated as equal and opposite to that of a dollar of expenditure on currently produced goods or services, whether that expenditure is made by consumers, investors, or government." (h)

(a) A. H. Hansen and H. S. Perloff, State and Local Finance in the Economy, New York, 1944, p. 245.

(b) H. C. Wallich, "Income-generating Effects of a Balanced Budget," Quarterly Journal of Economics, November 1944, pp. 78-91.

(c) N. Kaldor, "The Quantitative Aspects of the Full Employment Problem in Britain," Appendix C in W. H. Beveridge, Full Employment in a Free Society, New York, 1945, especially pp. 346-47.

(d) T. Haavelmo, "Multiplier Effects of a Balanced Budget," Econometrica, October 1945, pp. 311-18.

(e) G. Haberler, "Multiplier Effects of a Balanced Budget; Some Monetary Implications of Mr. Haavelmo's Paper," Econometrica, April 1946, pp. 148-58.

(f) W. A. Salant, "Taxes, Income Determination, and the Balanced Budget Theorem," Review of Economics and Statistics, May 1957, p. 161.

(g) M. H. Peston, "Generalizing the Balanced Budget Multiplier," Review of Economics and Statistics, August 1958, pp. 288-91.

(h) W. A. Salant, "Comment," op. cit., pp. 291-93.

Chapter 4

SHORT-RUN POTENTIAL--PROJECTIONS TO 1964

We are now ready to apply to the future the lessons we have drawn from the experience of two recent wartime periods during which government programs and expenditures were markedly expanded; these lessons will be considered in the light of current conditions and experience since World War II. Three projections are presented in Table X and Figure 6, each based on a different assumption concerning government expenditures. Any of the three would be hazardous if offered as a forecast of what is likely to happen during these next few years. They are presented not as forecasts or proposals but as models of how the economy might reasonably be expected to operate under the specified assumptions, in light of what we know of its fundamental nature and recent behavior. The alternative assumptions have been designed to establish successive limits of feasibility to the increase of government expenditures during the early part of the new decade, limits analogous to those we find to have been approached during past periods of expansion.

The heart of Projection A, the base projection, is the maintenance of the 1959-60 GE/GNP ratio of 20 percent (Figure 7). Maintenance of the 20 percent ratio implies a 3.6 percent annual growth of federal expenditures, providing an additional $8 billion a year by 1964, $7 billion of which could be allocated to national security, if needed (Figures 8 and 9).

The total GNP is shown as growing at 4.5 percent per annum. It is assumed that the additional demand represented by rising federal expenditures would help to stimulate the economy to this growth rate; tax and monetary policy changes to encourage investment and consumption would also be required. In other words, the $96 billion increase in GNP could probably not result solely from a $19 billion rise in GE--implying a multiplier of 5; there would have to be autonomous increases in investment as well.

It should be noted that the rate of 4.5 percent used in this basic projection falls well within the range of rates implicit in the 16 sets of projections examined in Appendix B.

The rate of 4.5 percent may be compared with that of 4.7 percent embodied in the NPA "judgment model" for 1965[1/] and in the NICB projection

1/ National Economic Projections, 1960 Series, National Planning Association, Washington, D.C., 1960.

Table X

NATIONAL SECURITY EXPENDITURES AND GNP (2): POTENTIAL BY 1964
(Billions of 1959 Dollars)

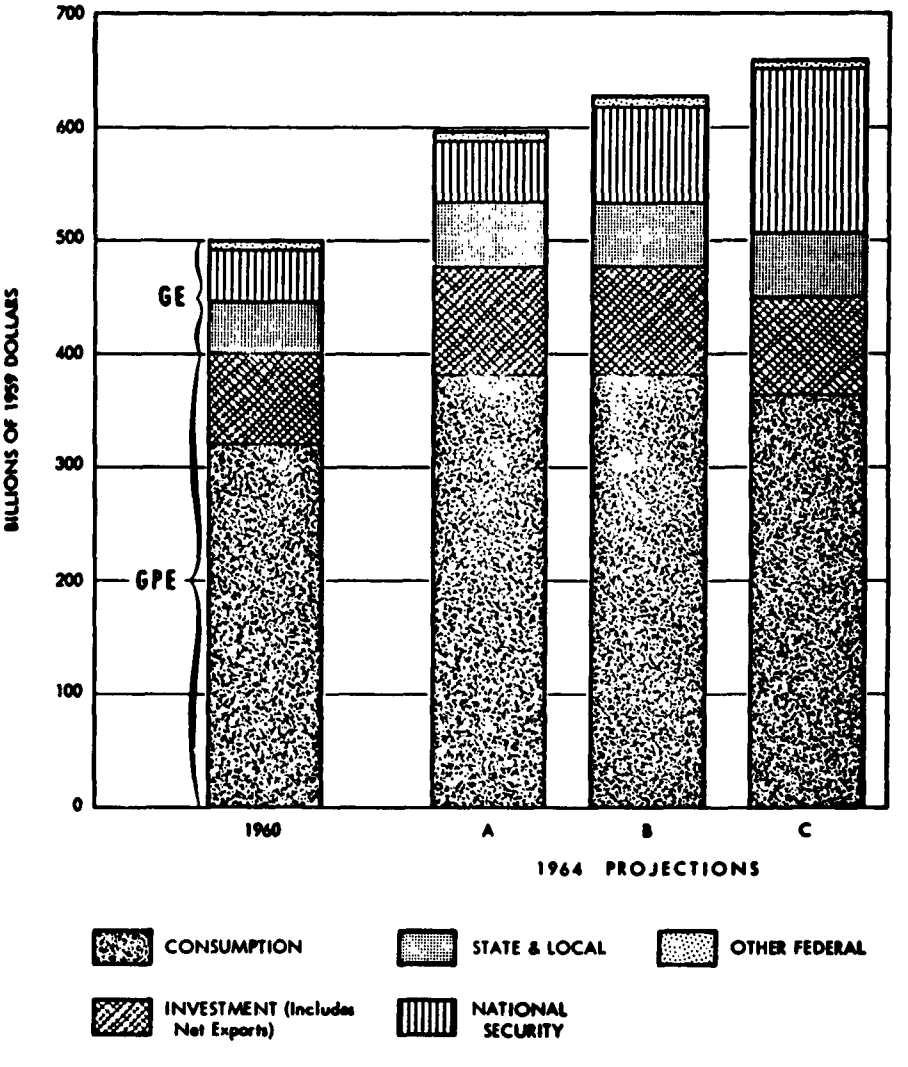
Variable	1960 (estimated)		1964								
			Projection A			Projection B			Projection C		
	(1) Amount	(2) Percent of GNP	(3) Amount	(4) Percent of GNP	(5) Average Annual Increase	(6) Amount	(7) Percent of GNP	(8) Average Annual Increase	(9) Amount	(10) Percent of GNP	(11) Average Annual Increase
Gross National Product (GNP)	$500	100.0%	$596	100.0%	4.5%	$627	100.0%	5.8%	$660	100.0%	7.2%
Government Expenditures (GE)	100	20.0	119	20.0	4.5	150	23.9	10.7	210	31.8	20.4
Federal	54	10.8	62	10.4	3.6	93	14.8	14.6	153	23.2	29.7
National security	46	9.2	53	8.9	3.6	84	12.4	16.2	145	22.0	33.2
Other	8	1.6	9	1.5	3.0	9	1.4	3.0	8	1.2	0.0
State and local	46	9.2	57	9.6	5.5	57	9.1	5.5	57	8.6	5.5
Gross Private Expenditures (GPE)	400	80.0	477	80.0	4.5	477	76.1	4.5	450	68.2	3.0
Consumption	320	64.0	382	64.0	4.5	382	60.9	4.5	364	55.2	3.4
Investment[1/]	80	16.0	96	16.0	4.5	96	15.2	4.5	86	13.0	1.8

1/ Including net exports of goods and services.

Source: Stanford Research Institute.

FIGURE 6

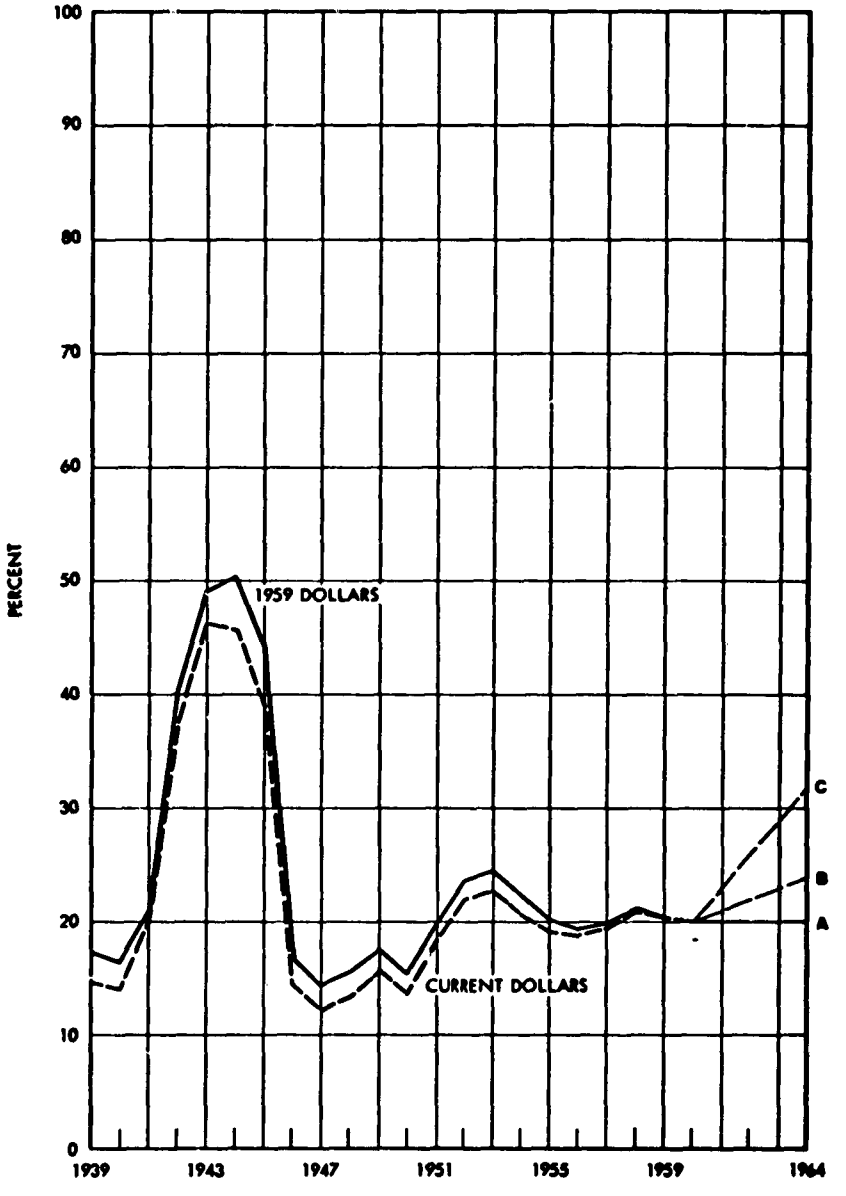
GROSS NATIONAL PRODUCT AND COMPONENTS
ESTIMATE FOR 1960 AND PROJECTIONS TO 1964



SOURCE: Table IX

FIGURE 7

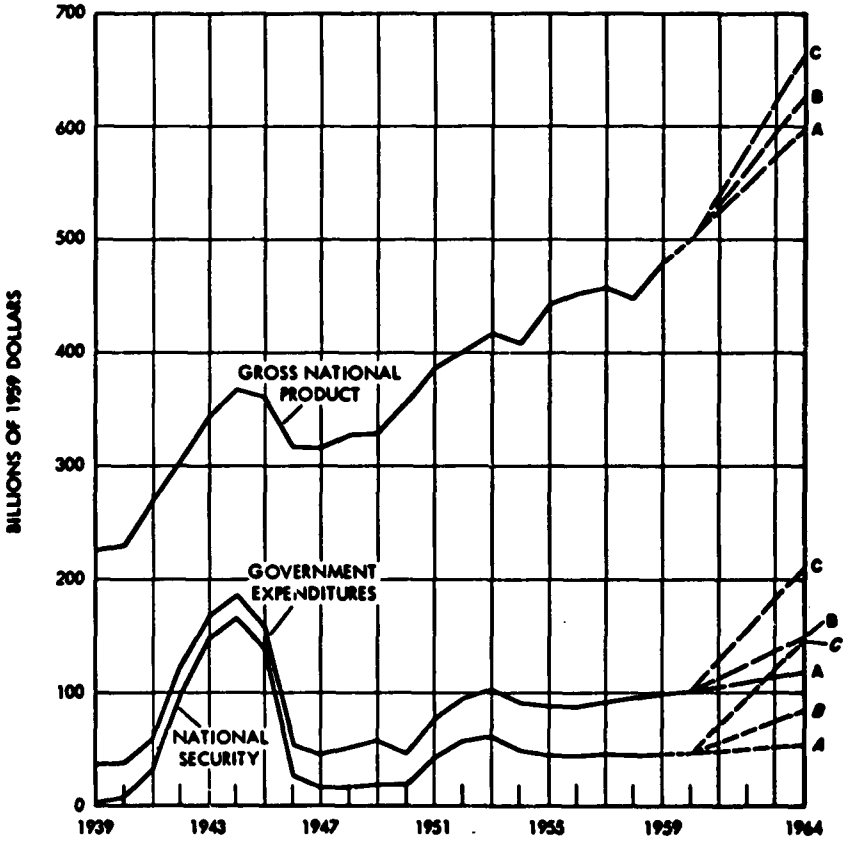
GOVERNMENT EXPENDITURES AS PERCENT OF GROSS NATIONAL PRODUCT, 1939 - 59, ESTIMATE FOR 1960, AND PROJECTIONS TO 1964 (1939 - 64 in 1959 Dollars and 1939 - 59 in Current Dollars)



SOURCES: Tables I, IX, and X.

FIGURE 8

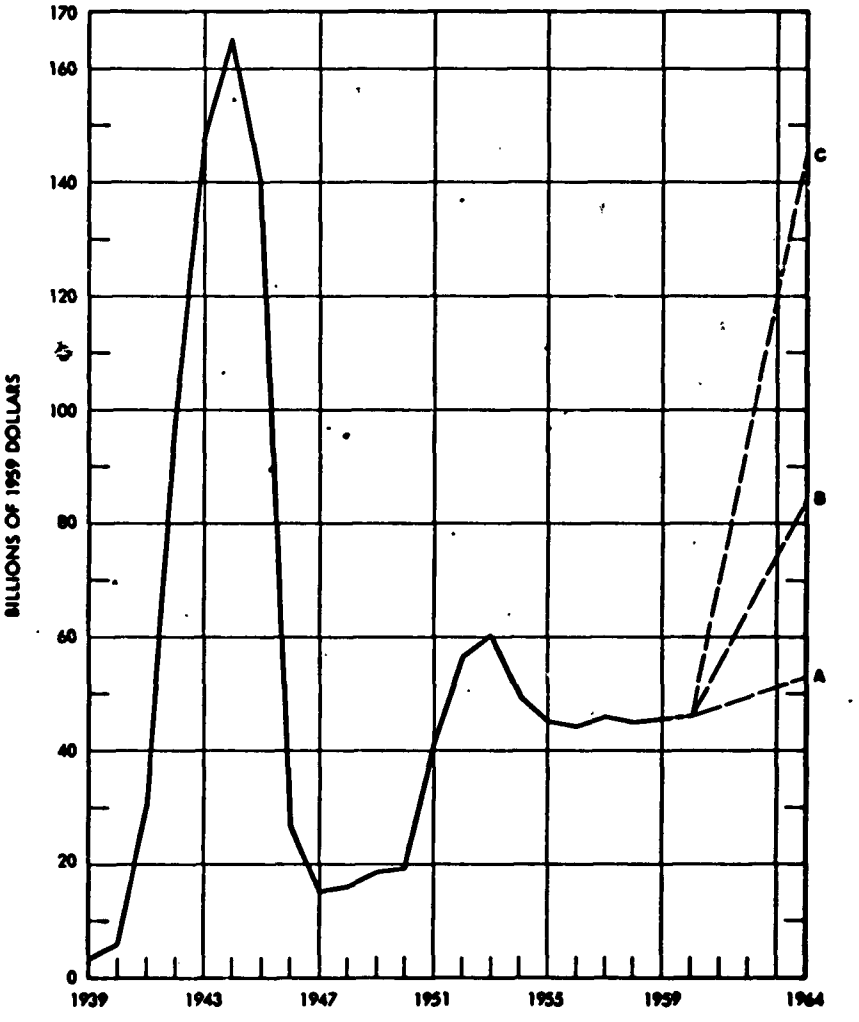
GROSS NATIONAL PRODUCT, GOVERNMENT EXPENDITURES, AND NATIONAL SECURITY EXPENDITURES
1939 - 59, ESTIMATE FOR 1960 AND PROJECTIONS TO 1964



SOURCES: Tables I, II, and X.

FIGURE 9

NATIONAL SECURITY EXPENDITURES
1939 - 59, ESTIMATE FOR 1960, AND PROJECTIONS TO 1960 - 1964



SOURCES: Tables II and IX.

to 1970.[1] Both of these, however, assume improvement of the employment ratio to 96 percent (4 percent unemployment), whereas we shall assume, for our basic projection, that it continues at the 1959 level of 94.7 percent.

State and local expenditures are assumed to rise at 5.5 percent a year, the rate experienced during 1954-59,[2] and this assumption has been made for Projections B and C, as well. This is neither a prediction of what will occur nor a statement of what should occur. It seems a reasonable assumption, inasmuch as the factors underlying the recent rate, particularly the rapid increase in school population, are expected to continue at least through 1964. It is of course possible that the actual rate will turn out to be higher, especially if increased federal expenditures for roads and education induce net additional matching state expenditures. It is conceivable, however, that heavier federal expenditures would prove a substitute for state and local outlays. And it is also possible that, with high levels of federal expenditure, under Projections B and C, higher interest rates or direct controls, or both, might reduce state and local outlays.

The assumption of a constant GE percentage has the advantage of maximum consistency with projections of a steady growth rate and minimum changes in the basic patterns of the economy (see Sources of GNP Growth, below). Changes in the average tax rates would not be required--there could, in fact, be a small decline (see Chapter 5). While there may be a requirement for measures to encourage investment, as mentioned above, there need be no basic changes in the saving and investment propensities of the population, in the rate of improvement of technology, or the allocation of resources among the sectors of the economy. The relationship of GNP to its potential would improve a little from that of the last few years.

1/ Economic Growth in the 1960's, National Industrial Conference Board, New York, 1960.

2/ The period 1954-59 is used rather than 1947-59 because state and local expenditures rose unusually rapidly in the late forties, as they caught up after sharp wartime curtailment. There was no cutback, but some slowdown under Korean controls. However, the trend since 1954 does not seem to be due to catching up; while 1954 was more than 10 percent above 1953, the average increase in the last two years has exceeded that for 1954-59 as a whole. At any rate, the post-Korean period reflects the current rate of growth of the school population, which did not obtain before Korea, and it is actually a more conservative base than 1947-59, for which the average annual rise was 6.2 percent. (See Table II for expenditures data.)

It is in the next two projections that basic economic changes are foreshadowed. Projection B provides for $84 billion of national security outlays in 1964, or $31 billion more than Projection A, and $38 billion more than in 1960. This brings total GE to 24 percent of GNP, or roughly the equivalent of the peak of the Korean effort.[1/]

In Projection C, security expenditures rise to $145 billion--$92 billion more than Projection A, and more than three times the present level. This brings GE to 32 percent--almost one-third--of GNP.[2/] This is well above the Korean percentage, but substantially less than the peak of World War II.[3/]

These are large and rapid buildups. A word, therefore, on the reasons for the selection of the year 1964. Since we are studying the limits of feasibility, we have deliverately taken the "worst case." Certainly, the projected levels of expenditure could be reached more easily if we allowed another year--or another decade--to reach them. If the need is immediate, they might then provide the "security" of a lock on the barn door after the proverbial horse is stolen. On the other hand, theoretically, as will be seen in the discussion in Chapter 5, given programs could be accomplished even more quickly, if more funds were expended.

1/ While GE reached 24.5 percent of GNP in 1953 when measured in 1959 prices, it was only 22.7 percent in current (1953) dollars. The calculation in 1959 prices is appropriate here, since we are interested in a comparable level of effort, as measured by resource inputs. The 1953 figure of 22.7 percent would purchase a smaller bill of goods (relatively) today--i.e., the greater inflation of prices for the types of goods and services purchased by government would erode the programs we are projecting.

2/ No attempt has been made to estimate nondefense federal expenditures with precision. Under A and B, they are assumed to grow somewhat as the economy grows, though less rapidly. In Projection C, it is assumed that national security programs will require that the line be held at current levels. While some items might have to increase, others would be deferred, there would be generally tighter control, and the high level of demand would lower requirements in some fields, such as agriculture.

3/ Government expenditures were 46 percent of GNP in 1943 and 1944, measured in current prices. In 1959 prices, they were about 50 percent. See footnote 1.

There are practical limits, however, to the minimum time for a given buildup. These limits involve administrative, development, construction, and production leadtimes which appear to add up to about three years, give or take a few months, after the year of decision. Our historical precedents provide evidence on this. Although Pearl Harbor came near the end of 1941, many of the decisions had been taken in 1940 and early 1941, and the war effort neared its peak in 1943. Thus the rapid buildup was accomplished in three years; 1944 saw further growth but at a decelerating pace. In 1950, the Korean incident broke out at midyear, and the major program decisions were taken rapidly thereafter. Federal expenditures did not start up until 1951, and they reached their peak in the third year--August 1953, to be precise, three years and two months after the Korean outbreak.

This study is being made in 1960. The earliest point in time it can contemplate for major new program decisions is 1961. The earliest date for completion of the buildup is therefore 1964, three years later.

We have striven not to burden the discussion with excessive detail. The levels and composition of GE and GNP for the years between 1960 and 1964 have not, therefore, been included in the projections. Projection A might easily progress by equal percentage increments, in all categories, each year. Projections B and C would not. In 1961 there would be no significant increase in GE. The democratic process of reaching the major decisions, however, and the promise of large increases in the following years, might well lead to large, speculative increases in GPE, in both personal consumption and business investment, as they did in 1940 and 1950. In 1962, 1963, and 1964, GE would rise rapidly. The earlier patterns were as follows (computed from Table I):

Change from Previous Year
(Based on 1959 Prices)

Year	GE	GPE
1940	3%	10%
1941	53	9
1942	110	-13
1943	51	-5
1944	10	4
1950	-4	11
1951	40	3
1952	23	-1
1953	8	3

But before we consider the feasibility and implications of the large three-year buildups in Projections B and C, let us consider how their effects on GNP and GPE are estimated.

Impact of Government Expenditures on the Economy

In Projections B and C, government expenditures increase, not at an assumed rate, but to assumed levels, levels that represent proportions of GNP approximating those attained during earlier periods of rapidly increased government spending. In determining the impact on GNP that may be expected from such increased expenditures, we must examine the earlier record more closely.

In Chapter 2 (Table V) the increase of GNP was related to the corresponding increase of GE, for 1940-44 and 1950-53. Here it was that we saw how much of an increase of GNP may result under increasing GE. Part of the increase of GNP associated with increased GE, however, reflects the basic relationships of the period, since the increasing potential of the economy enables GNP and its components to expand at roughly proportional rates, as in Projection A.

For purposes of Projections B and C, we are concerned with the relation not of the total increase of GNP, but of its increase above a basic trend, accompanying increases of GE above such a trend.

In Table XI the appropriate comparisons are shown for the two earlier periods, 1940-44 and 1950-53. The underlying assumption is that, in the absence of expanded government expenditures (at a rate greater than that of GNP expansion), GNP would have increased during each period at the same rate as that at which potential GNP increased during the preceding years. For 1950-53, the preceding decade provides an appropriate basis for this comparison; the average rate from 1940 to 1950 was 3.2 percent. For 1940-44 it would be inappropriate to take the 1930-40 rate of 1.9 percent, which reflects the depression. Instead we take the 1935-40 average of 2.8 percent, only modestly below the 1940-50 rate, in which the accelerating effects of wartime expansion are of course reflected.[1/]

The difference between actual GNP and GNP increasing from the base year (1940 or 1950) at the uniform annual rate (2.8 or 3.2 percent) is related in Table XI to the difference between actual GE and GE increasing

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1/ See Knowles, op. cit., p. 37.

Table XI

INCREASES ABOVE TREND IN GOVERNMENT EXPENDITURES AND GROSS NATIONAL PRODUCT
1940-1944 and 1950-1953
(Billions of 1959 Dollars)

Year	GE		GNP		Actual minus Trend		Average Annual Increase from Base Year (1940 or 1950) Net of Trend		Ratio of Increments GNP/GE	
	(1) Actual	(2) Trend[1/]	(3) Actual	(4) Trend[1/]	(5) GE	(6) GNP	(7) GE	(8) GNP	(9) Annual (6)/(5)	(10) Cumulative Average (8)/(7)
1940	$ 37.7	$ —	$229.9	$ —	$ —	$ —	$ —	$ —	—	—
1941	57.7	38.8	267.7	236.3	18.9	31.4	18.9	31.4	1.7	1.7
1942	121.2	39.9	304.1	242.9	81.3	61.2	50.1	46.3	0.6	0.9
1943	166.9	41.0	341.6	249.7	125.9	91.9	75.4	61.5	0.7	0.8
1944	184.2	42.1	366.3	256.7	142.1	109.6	92.0	73.5	0.8	0.8
1950	54.6	—	356.2	—	—	—	—	—	—	—
1951	76.6	56.3	385.0	367.6	20.3	17.4	20.3	17.4	0.9	0.9
1952	94.1	58.1	399.0	379.4	36.0	19.6	28.2	18.5	0.5	0.7
1953	102.0	60.0	417.1	391.5	42.0	24.6	32.8	20.5	0.6	0.6

1/ For 1940-44, at 2.8 percent a year; for 1950-53, at 3.2 percent (see text for explanation).

Source: Stanford Research Institute, based on Economic Report of the President, 1960, Table D-2, for columns 1 and 3.

at that rate. It will be noted that the ratio of the increase of GNP above trend to the corresponding increase of GE was twice as great between 1940 and 1941 as between 1950 and 1951. The explanation for this difference cannot lie in the relative levels of GE in the two base years, for there was no significant difference in the GE/GNP ratio in the two years (see Table V, column 3). Nor may we rely on the greater proportional increase of GE in 1940-41 (53 percent) than in 1950-51 (40 percent), for this would imply that the larger the increase in GE, the more readily will the economy expand to accommodate it. Apart from any absurdity it may contain, such an interpretation is inconsistent with the corresponding comparisons for later years.

The true explanation appears to lie primarily in the marked difference between 1940 and 1950 with respect to the slack in the economy.[1/] The increase after 1940 began from a relatively lower level of national economic performance than was true in 1950. To take a key indicator, unemployment was 14.4 percent in 1940; in 1950 it was 4.9 percent. The more general Knowles's comparison shows GNP in 1940 at 10 percent below potential, while in 1950 it was 4.7 percent above. It is clear, therefore, that in 1940 there was a higher proportion of idle resources available to be drawn readily into production than in 1950, so that the initial effect of increased government expenditures was understandably greater. As slack was eliminated after 1940, the further increase of GE above the 1935-40 expansion rate for GNP was reflected in differential increases of GNP quite comparable with those that followed 1950.[2/]

In 1940 the economy experienced its eleventh year of below-potential operation, as this is measured by Knowles. During the 15-year period

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1/ Other factors, of course, also entered in. In particular, the higher rate of taxation in 1950-51, and the much lower relative reliance on deficit-financing, undoubtedly played a significant role. In fiscal 1951 there was actually a budget surplus. While this turned into a deficit for calendar 1951, there remained a net cash surplus for the federal government (and for all levels of government taken together). (See Economic Report of the President, 1960, Tables D-51 and D-53.) Thus, on this basis, too, a close approximation to the "balanced budget multiplier of unity is not surprising.

2/ Again, it was not simply that the amount of slack, or lack of it, was comparable; recognizing the disappearance of the slack, the government appears to have taken measures of control, direct and indirect, roughly proportionate to the need, i.e., in appropriate relation to the degree of expansion of government demand.

that followed, there were only three years (1947, 1949, and 1954) in which GNP fell below potential. During the five years beginning with 1956, GNP has run consistently below potential, the percentages for 1959 and estimated 1960 being 93 and 94, respectively. The particular percentage may be subject to criticism, but the proposition that in 1960 the U.S. economy is operating at a level only a few percent closer to potential than was true in 1940 will find wide acceptance. It follows that, in estimating the effect on GNP of an increase of GE above the 20 percent in Projection A, we should be guided more by the record of 1940-41, than by that of 1950-51.

As shown in Table XI, the ratio in 1940-41 of the differential increase of GNP to the differential increase of GE was 1.7. Once the slack was taken out of the economy,[1/] the effect on GNP of increased GE was markedly damped, as is clear from both Table V and Table XI. Also, after 1950, when Knowles reports performance above potential rather than below, differential increases of GE above the 1940-50 GNP rate were accompanied by more modest corresponding increases of GNP, the ratio varying between 0.9 and 0.6.

From these comparisons and estimates of potential 1964 GNP, we can draw reasonable conclusions for Projections B and C. Knowles estimates 1964 potential as follows:[2/]

	Billions of 1959 Dollars
Low	$611
Median	623
High	630

Thus, the Projection A GNP of $596 billion is 97.5 percent of the low estimate of potential, 95.7 percent of the median. Accordingly, we use a multiplier of 1.0 for the GNP increase accompanying the $31 billion increase in GE in Projection B. This compares with 0.8 for the increments above trend in 1944, but it brings GNP less than 1 percent above the median estimate of potential for 1964, whereas GNP was 18.3 percent above potential in 1944.

1/ Knowles's percentage for 1941 is 100.8, although it was 1942 before unemployment declined below 5 percent.

2/ Unpublished, stated by Knowles to be consistent with his published work (op. cit.).

In Projection C, GE is $60 billion more than in Projection B; for this increment, we use a factor of 0.55, the average of the 1952 and 1953 ratios. This raises GNP $33 billion and brings it to 105.8 percent of Knowles's median potential, or 104.8 percent of the high estimate (which would become the more appropriate standard under the impact of the Projection C buildup from 1961 to 1964). GNP was 103.9 percent of potential in 1952, and 104.1 percent in 1953.

As we have noted earlier, when the economy is approaching capacity operation, other forces come into play as a result of government control policies. These policies limit the growth of GPE and hence of GNP. Without them, the multiplier in Projection C might approach, say, 3 or 4, instead of 0.6. To the extent that capacity limits prevented the response of supply, the excess demand would be dissipated in inflation.

Controls may be of several kinds. Indirect controls include fiscal and monetary policy;[1/] direct controls include allocation, rationing, credit restriction, price control, and wage control. The objectives of fiscal policy are perhaps the broadest. Taxes may be levied in the first instance to pay for the government expenditures to a maximum extent considered feasible or appropriate, i.e., to work toward a balanced budget. In addition, they may be used to allocate resources--to ensure accomplishment of the government programs while limiting the private sector. A further objective may be to control inflation (which may, of course, be the indirect purpose of the first objective).[2/]

The objective of monetary controls is primarily the control of inflation. Indirectly, again, this may serve other purposes. Direct controls may have the objectives of allocating resources and of helping to control inflation. Equity among citizens or classes of citizens is often also an objective.

Some of the important aspects of the meeting of these objectives will be discussed in the next chapter. Here we wish simply to note that these are major determinants of the effective multiplier and the reasons why, in

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1/ Other indirect controls include a wide range of government regulatory actions--antitrust suits; trade, labor, and agricultural regulations; etc.

2/ Taxes may, of course, be used for many other purposes, such as the restriction of particular activities, the redistribution of wealth, and so on. We are concerned here with those objectives specifically related to the rapid expansion of GE.

the type of case considered in this paper, the effective multiplier may be far below the pure multiplier which might be expected, under the circumstances, from the propensity to consume. Their effect on investment and consumption is considered below.

Consequences for Private Investment

We are now in a position to consider the impact of the projected expansion of government programs on the share of national product left for private use--gross private expenditures (GPE). GPE is customarily broken down into personal consumption, which we will call C, gross private domestic investment, and net exports (the goods and services component of net foreign investment). Net exports are very small; since 1948 they have not exceeded 1.5 percent and have averaged 0.5 percent. For simplicity we have lumped them, it will be recalled from Chapter 1, with domestic investment, calling the total I, so that C + I = GPE.

For the base year, 1960, I is estimated at 16 percent of GNP. For reasons discussed above, it remains at the same percentage in Projection A. Before we consider investment in Projections B and C, let us again note a bit of history. It appears that the ratio of I to GNP tends to be lower when the GE/GNP ratio rises significantly. There are several reasons for this, including:

1. To some extent the federal government supplies its own investment requirements for increased production, particularly in periods of sharp expansion for national security purposes. War plants are built to manufacture armaments, special tooling is supplied for conversion of existing plants, special tooling is purchased even in peacetime for such purposes as airplane production.[1/]

2. When GE is rising sharply, some of the increased output generally comes from an increased ratio of actual to potential GNP, that is to say, from more intensive use of existing capital, as distinguished from new capital (which increases potential).

3. At such times, imports may tend to rise, and exports may be restricted (by war conditions, limited supply, or government policy), so that net exports decline.

1/ We cannot speak quantitatively of total investment, but only of private investment. Unfortunately, in the accounting for government expenditures there is no distinction made between investment and consumption.

4. Some kinds of investment, notably housing and farm plant and equipment, are more closely related to the level of consumption than GNP or GE.

5. When GE is rising very rapidly, the government generally restricts investment, through direct controls as well as monetary policy, in order to ensure the priority of its needs.

The data for our two wartime precedents are illustrative. On the basis of current prices, the two ratios were as follows (computed from Table III):

Year	GE / GNP	I / GNP
1940	14.0%	14.6%
1941	19.7	15.3
1942	37.5	6.1
1943	46.0	1.8
1944	45.6	2.4
1950	13.7	17.8
1951	18.4	17.8
1952	21.9	14.8
1953	21.9	13.6

In World War II, and to a lesser extent during Korea, government controls were the dominant factor in restricting investment. (The factors mentioned above are not independent, however; each of the first three factors helps to make it practicable for the government to exercise the controls mentioned fifth.)

In Projection B, the volume of investment has been held constant from Projection A. It declines from 16 to about 15 percent of GNP simply because GNP rises. This would seem to imply little, if any, deferment of needed investment. We will argue in the next chapter that some monetary controls will be required (indeed, under the system of flexible monetary policy in practice since 1951, it is hardly possible not to have monetary controls), but that direct controls will probably not be needed.

The level of investment has been somewhat reduced in Projection C, and the percentage of I in GNP declines to 13. This is roughly comparable to what happened during Korea, and we will argue in the next chapter that the degree of controls set up during Korea turned out not to be needed, but that something comparable (in degree, not necessarily in format), will be needed for the larger effort of Projection C, with GE at 32 percent of GNP.

The Consumer's Share Grows Steadily

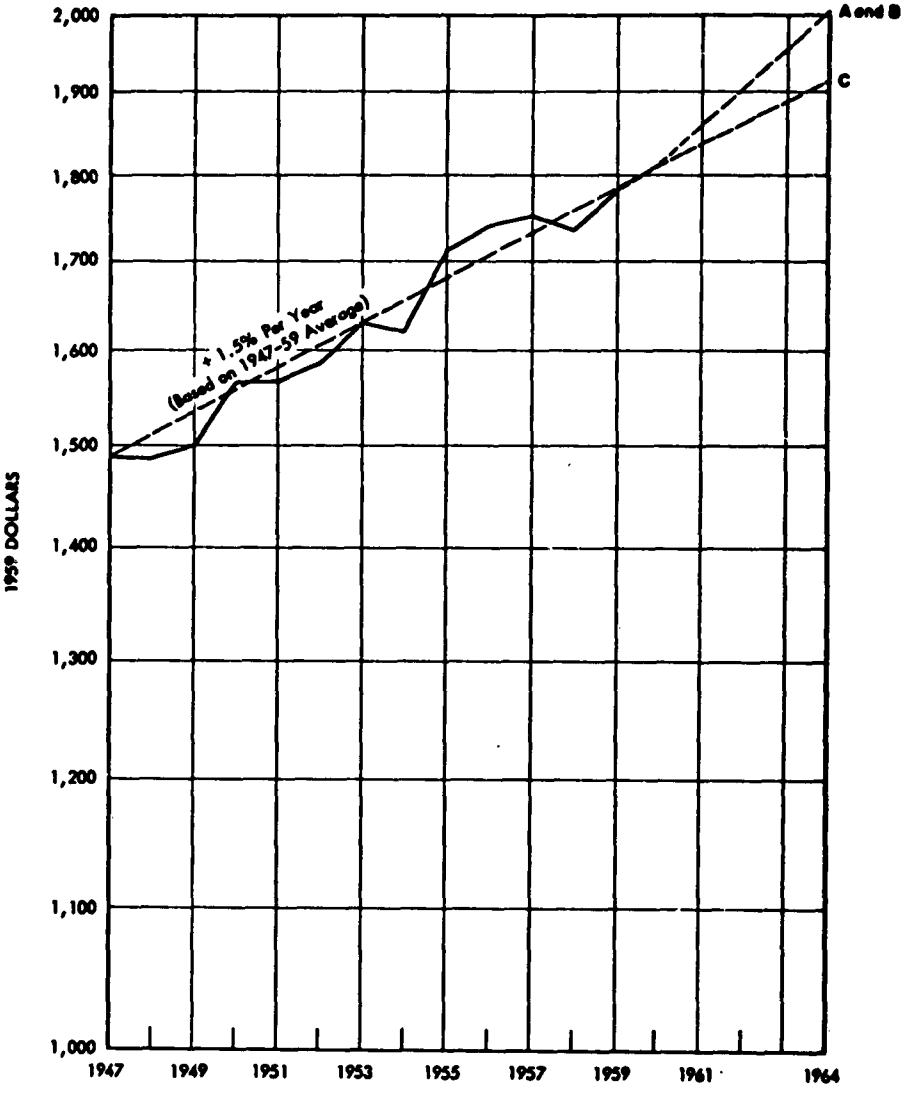
The remainder of GPE, after investment, is available for consumption. Under Projections A and B, consumption rises at 4.5 percent a year. With population growing at about 1.7 percent, this leaves 2.8 percent for per capita growth, i.e., for a rising standard of living. This is more than has obtained during any protracted period in our history. It may even be difficult to achieve under the conditions of Projection A; it is quite probable under those of Projection B, and indirect controls, possibly even some direct credit controls, might be needed to keep consumption from going even higher until the government programs were assured. On the other hand, in light of the analysis of feasible growth which follows, it might prove perfectly practical to permit C, GPE, and GNP to grow more rapidly.

In Projection C, consumption has definitely been held down, even though it grows at 3.4 percent a year, which is 1.7 percent per capita and somewhat better than the long-term historical average. (Figure 10.) But in an economy which is growing at more than double that rate, over 7 percent, very heavy demand pressures will exist and strong controls will be needed. Credit controls of the "Regulation W" type (limiting installment sales terms) would undoubtedly play a role. Material controls would quite likely limit consumer durables output. Rationing seems an unlikely requirement, particularly if consumption taxes are used, but in any event the World War II stringencies would certainly not be approached. These considerations will be discussed in Chapter 5. Suffice it to note here that restrictive measures might well lead people to talk of "sacrifice," but that there would be no sacrifice, by the standard to which we have become accustomed--growth at 1.5 percent a year per capita (the rate from 1947 to 1959, and from 1929 to 1959, as well).

In the nonwar, non-full-mobilization situation we are considering, it is important that this growth of per capita consumption continue. We are not entering here into the question of whether continued growth of personal consumption is a proper national objective, nor whether it is needed to permit the marginal consumer to come up to some minimum standard. We are simply recognizing the need for incentives to induce the extra effort needed to produce the output called for in the projections. As will be seen in the next section, the added output must come not just from increased population and productivity, but also from the willingness of more people to enter the labor force and of the employed to work longer hours. It must even come, in part, from the willingness of the unemployed to accept jobs offered them and, indeed, of the employed to continue at work.

FIGURE 10

PER CAPITA CONSUMPTION EXPENDITURES, 1947 - 59,
ESTIMATE FOR 1960 AND PROJECTIONS TO 1964



SOURCES: Tables VI and X; 1964 projections derived from an interpolation of population projections given in Current Population Reports, Series P. 25, No. 187, p. 16, Series III.

The incentives to do these things will be impaired if there is too small a supply of consumer goods and services--if, in effect, it is necessary to reduce consumer expenditures, by taxation or other forms of control, so drastically that individuals feel denied the tangible rewards of going to work or of working overtime. There are substitute incentives: the fears, angers, and prides of hot war provide one; compulsion is possible in some societies; exhortation may work; the promise of eventual opportunity to spend forced savings may have some effect; and the simple necessity of working to eat, on whatever scale, will drive many. But in a free society, in peacetime, these alternatives are either unavailable or inadequate to induce the considerable projected increases in collective effort. The provision of tangible reward, through the operation of the market place, remains the simplest means to the projected end; it is the means most consistent with the accepted tenets of our society, and the means most likely to be employed as long as it is feasible. This study demonstrates that it is feasible.

The Sources of GNP Growth

We have examined the demand side of the equation, in terms of the effective multiplier (some of the implications of which will be further discussed in Chapter 5). It remains to consider the supply requirements. Our procedure for establishing the feasibility of the projections in terms of resource availability views GNP as output per person times the number employed. Employment is a function of the population of working age, the rate of participation in the labor force, and the rate of employment (or its complement, the rate of unemployment) of the labor force. Output per person is a function of the length of working hours (the average work-week) and output per man-hour, or productivity. Productivity subsumes the factors of production other than labor--capital investment, natural resources, technology, managerial capabilities, and institutional arrangements.

These factors are summarized in Table XII, in the format established in Table VIII on the wartime sources of growth. We will discuss each factor in turn. The estimates are explained in detail in the notes to the table.

The population over 14 rises at 1.8 percent a year from 1960 to 1964. This is the long-awaited labor force boom of the sixties, as the issue of the postwar baby boom comes of working age.

Labor force participation always rises in periods of high demand. New entrants join the labor force when opportunities are plentiful. If demand is as high as in Projection A, these upward pressures are likely

Table XII

SOURCES OF GROWTH (2): PROJECTIONS TO 1964
SUMMARY OF EMPLOYMENT AND PRODUCTIVITY ASSUMPTIONS

Growth Factor	(1) 1960	Projection A		Projection B		Projection C	
		(2) 1964	(3) Average Annual Change from 1960	(4) 1964	(5) Average Annual Change from 1960	(6) 1964	(7) Average Annual Change from 1960
Employment							
1. Population over 14 (millions)	126.5	135.7	1.8%	135.7	1.8%	135.7	1.8%
2. Labor force participation rate	58.1%	58.0%	—	58.4%	—	59.0%	—
3. Labor force (millions)	73.6	78.7	1.7%	79.3	2.0%	80.1	2.1%
4. Employment rate	94.7%	96.0%	—	97.0%	—	98.0%	—
5. Employment (millions)	69.7	75.6	2.1%	76.9	2.5%	78.5	3.0%
Productivity							
6. Output per man-hour	$3.41	$3.83	3.0	$3.90	3.5%	$3.90	3.5%
7. Average weekly hours	40.5	39.6	-0.6%	40.2	-0.2%	41.6	+0.6%
8. Output per employee (annual)	$7,174	$7,884	2.4%	$8,153	3.3%	$8,410	4.1%
Gross National Product							
9. Real gross national product (billions of 1959 dollars)	$500	$596	4.5%	$627	5.8%	$680	7.2%

Note: See following pages for notes and sources.

Notes and Sources for Table XII

Line 1. Census projections, as published in Bulletin No. 1242, Population and Labor Force Projections for the United States, 1960 to 1975, Bureau of Labor Statistics, p. 52 (interpolated for 1964). Noninstitutional population over 14 would provide a more precisely correct base, but trend analysis would not be significantly affected. Both estimates are highly reliable, since all persons over 14 in the sixties have already been born.

Line 2. Labor force (line 3) as a percent of population over 14 (line 1). The U.S. Dept. of Labor, Bureau of Labor Statistics, Div. of Manpower and Employment Statistics (by letter, December 1, 1959) projects labor force participation at 57.8 percent in 1964, taking account of the trend for the younger age classes to stay in school longer, and other long-term factors. We have raised this figure somewhat to take account of offsetting factors tending to raise the participation rate when growth is more rapid and the employment rate higher; an even 58 percent is used for Projection A. The rate for Projection B is slightly higher, at 58.4 percent; for Projection C it is 59 percent, still far below the 62 percent reached in 1944.

Line 3. Derived from lines 1 and 2. The 78.7 million for Projection A is slightly higher than the 78.4 projected by the Bureau of Labor Statistics (see note for line 2) under more modest growth assumptions.

Line 4. Employment (line 5) as a percent of labor force (line 3). The 96 percent used for Projection A represents a return to the 4 percent unemployment level of 1956, the lowest figure since the Korean period but still relatively high for a prosperous postwar year (see Figure 11). The 3 percent unemployment average during the Korean years is used to derive the 97 percent for Projection B; the higher demand in Projection C is assumed to push unemployment down to 2 percent, still double the 0.9 percent of 1944. There is, of course, a trade-off between lines 2 and 4 to support any given, or required, level of employment. For example, if the labor force participation rate used in Projection A were the Bureau of Labor Statistics figure of 57.8 percent, this could be balanced by an increase of 0.3 to 0.4 in the employment rate; the fact that both rates appear to be conservative in face of the high level of projected demand reflects the tremendous slack in the economy even under Projection A.

Line 5. Employment: total civilian employment plus Armed Forces (2.5 million in 1960), derived from lines 3 and 4.

Line 6. Output per man-hour, the measure of average labor productivity. Projection A assumes the rate of growth of productivity from 1947-59. Projections B and C have been kept to the rate achieved in the more rapidly expanding 1947-55 period. (See Table XIII.) The trend of output per man-hour equals the net effect of the trends of output per employee (line 8) and hours worked (line 7). See text for discussion of factors influencing the trend of productivity.

Line 7. Average weekly hours worked in agricultural and nonagricultural industries combined. The 1960 figure of 40.5 hours represents the average for the first six months of 1960. It is also the average for 1959, a year that is assumed to have been somewhat depressed by the steel strike. We have seen that average weekly hours declined by 0.6 percent a year from 1947 through 1955 or 1959 (although the drop was at almost 0.7 percent from 1955 to 1959). We have allowed for continuation of this downtrend in Projection A, but in Projection B have posited that the average work-week increased slightly (at 0.2 percent) and in Projection C by somewhat more (0.6 percent a year). Continued only four years, these are not serious reversals of trend and do not mean onerous hours of employment; the highest level, 41.6 hours in Projection C, compares with 42.4 in 1952, the Korean peak, and 48.5 in World War II (1943). It should be noted that the average work-week is not the same thing as the standard work-week. In the short run, the average varies primarily because of variations in overtime, and in part-time employment (underemployment, or partial unemployment, when involuntary). Over the longer term, it varies because of changes in the basic work-week, paid vacations, and paid holidays. An increase in hours over a four-year period need not mean a reversal of the secular downtrend in the standard work-week or in paid vacations and holidays; it may simply mean more overtime and less part-time work.

Line 8. Output per employee: real gross national product per employed person. Projection A assumes an average annual rate of growth equal to that of the 1947-59 period; Projections B and C assume that higher growth of the 1947-55 period, after adjustment for the changes in the trend of hours worked (line 7).

Line 9. Product of lines 5 and 8, and equal to the first line of Table X. Note that percentages in line 9 follow from those in lines 5 and 8, by multiplication (not addition) in decimal form, after the addition of 1 to each factor; e.g., in column 7, 1.030 x 1.041 = 1.072.

to offset the downward influences which BLS took into account. We have held the ratio at 58.0 percent in Projection A, adding a modest 0.4 percent for the higher demand and lower unemployment in Projection B and another 0.6 percent for C. This brings Projection C to 59.0 percent, still very much closer to the current level than to the World War II rate of 62.0 percent (when the draft as well as job opportunities pushed the rate up).

Similarly conservative projections of the employment rate are spelled out in the notes to Table XII. They lead to the projections of employment on line 5 and, by implication, to a reversal of the post-Korean uptrend of the unemployment rate shown in Figure 11.

Output per Employee (the quotient of GNP divided by employment) is shown in Table XIII. This ratio increased at 2.4 percent a year from 1947 to 1959. But during the same period, average weekly hours fell at 0.6 percent a year; output per man-hour had risen at 3.0 percent. These postwar averages are used for Projection A; they have been associated with a growth rate of only 3.5 percent for real GNP, and so appear to be quite conservative for a period of growth at 4.5 percent.

From 1947 through 1955, however, output per man-hour grew by 3.5 percent (while real GNP rose at 4.3 percent). This rate of increase of productivity was associated with a real GNP annual growth of 4.3 percent. Again in the interest of statistical conservatism, we have used the 3.5 percent rate not for Projection A, but for Projections B and C, in which GNP growth is much more rapid.

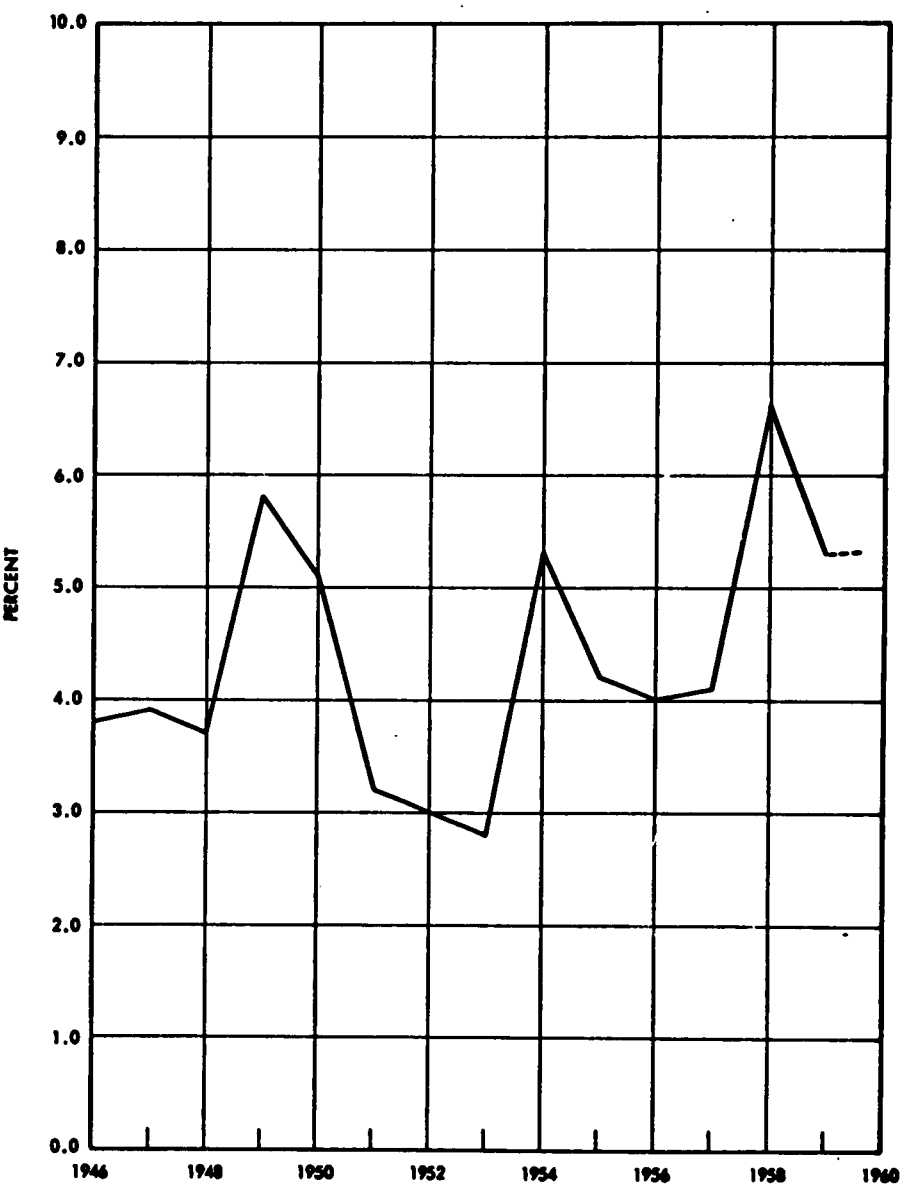
It can be argued that 1947-55 was a rather unusual period, in which two nonrecurring events probably served to accelerate the improvement of productivity. First, there was the period of postwar expansion of the civilian economy (after a one- to two-year period of adjustment, of "turnaround time" for the reconversion and reorientation of business). Productivity was helped in this period both by the rapid expansion of many lines of production and by the opportunity to exploit in the civilian economy many of the wartime technological gains which were available for military purposes only until peace returned.

Second, there was the Korean period of stimulated production, during which productivity was especially helped by the shift in the product-mix, with a much increased relative weight for highly processed, high-value military hardware, in which high productivity is implicit.

These arguments have validity, but they do not negate the argument that the average rate of productivity increase for that period might well

FIGURE 11

UNEMPLOYMENT AS PERCENT OF TOTAL LABOR FORCE
ANNUAL AVERAGES, 1946 - 1959



SOURCE: Table VII.

Table XIII

GROSS NATIONAL PRODUCT, LABOR FORCE, EMPLOYMENT, AND OUTPUT PER EMPLOYED PERSON
1947-1959, Estimates for 1960, and Projections to 1964

Year	(1) Gross National Product (billions of 1959 dollars)	(2) Labor Force (millions)	(3) Employment (millions)	Output per Employed Person			
				(4) Total (dollars)	Change from Previous Year		(7) Average Annual Rate of Growth
					(5) Dollars	(6) Percent	
1947	$315.7	61.8	59.4	$5,315	$ —	—	
1948	327.9	62.9	60.6	5,411	96	1.8	
1949	328.3	63.7	60.0	5,470	59	1.1	
1950	356.3	64.7	61.4	5,801	331	6.1	2.9%
1951	386.0	66.0	63.9	6,025	224	3.9	
1952	399.0	66.6	64.6	6,177	152	2.5	
1953	417.1	67.4	65.5	6,368	191	3.1	2.4
1954	406.6	67.8	64.2	6,368	0	0.0	
1955	441.5	68.9	66.0	6,689	321	5.0	
1956	450.9	70.4	67.8	6,670	-19	-0.3	1.3
1957	458.9	70.7	67.8	6,768	98	1.5	
1958	448.6	71.3	66.8	6,736	-32	-0.5	
1959	478.8	71.8	68.1	7,031	296	4.4	
1960	500.0	73.6	69.7	7,174	143	2.0	
1964							
Projection A	596.0	78.7	75.6	7,884	—	—	2.4
Projection B	627.0	79.3	76.9	8,153	—	—	3.3
Projection C	660.0	80.1	78.5	8,410	—	—	4.1

Source: Columns 1, 2, and 3 for 1947-59 from Tables I and VII; see text for explanation of estimates and projections. Columns 4-7, computed.

be equaled or even exceeded during the period of our projections, under the conditions postulated for B and C. Here again we would have greatly accelerating demand and tighter labor supply, conditions conducive to more intensive utilization of manpower, i.e., greater productivity. Where the period of the late 1940's could draw on reserves of technological advancement during the war, the early 1960's can utilize the fruits of the "R&D boom" (both public and private) of the 1950's. A large proportion of the fruits of this technological boom has up to now gone unexploited, as we may infer from the 2.0 percent annual productivity growth from 1955 to 1959. In the long run, increased attention to management sciences, scientific education, and public concern with productivity will also exert an upward force.

Moreover, the same type of product-mix shift toward higher-value military items is likely to play some role in any national security buildup as rapid as that in either Projection B or Projection C.

On line 9, we have arrived back at the projected GNP's of Table X, by routes which have made explicit the requirements of manpower and productivity for the achievement of each of the projections. These routes are not the only possible ones. For example, under the stated conditions of high demand for both output and labor, productivity might well increase more rapidly than we have projected. In this event, there could be a shorter work-week, or lower employment or labor force participation rates, or some combination of these. If, on the other hand, productivity failed to gain as rapidly as shown in the table, there would still be some slack to be taken up in the figures for the labor force, employment, and hours of work. We have simply shown one line in a spectrum of ways in which each of the projections would be feasible from the point of view of resources, or supply. The combinations of factors we have used are shown graphically in Figures 12 and 13.

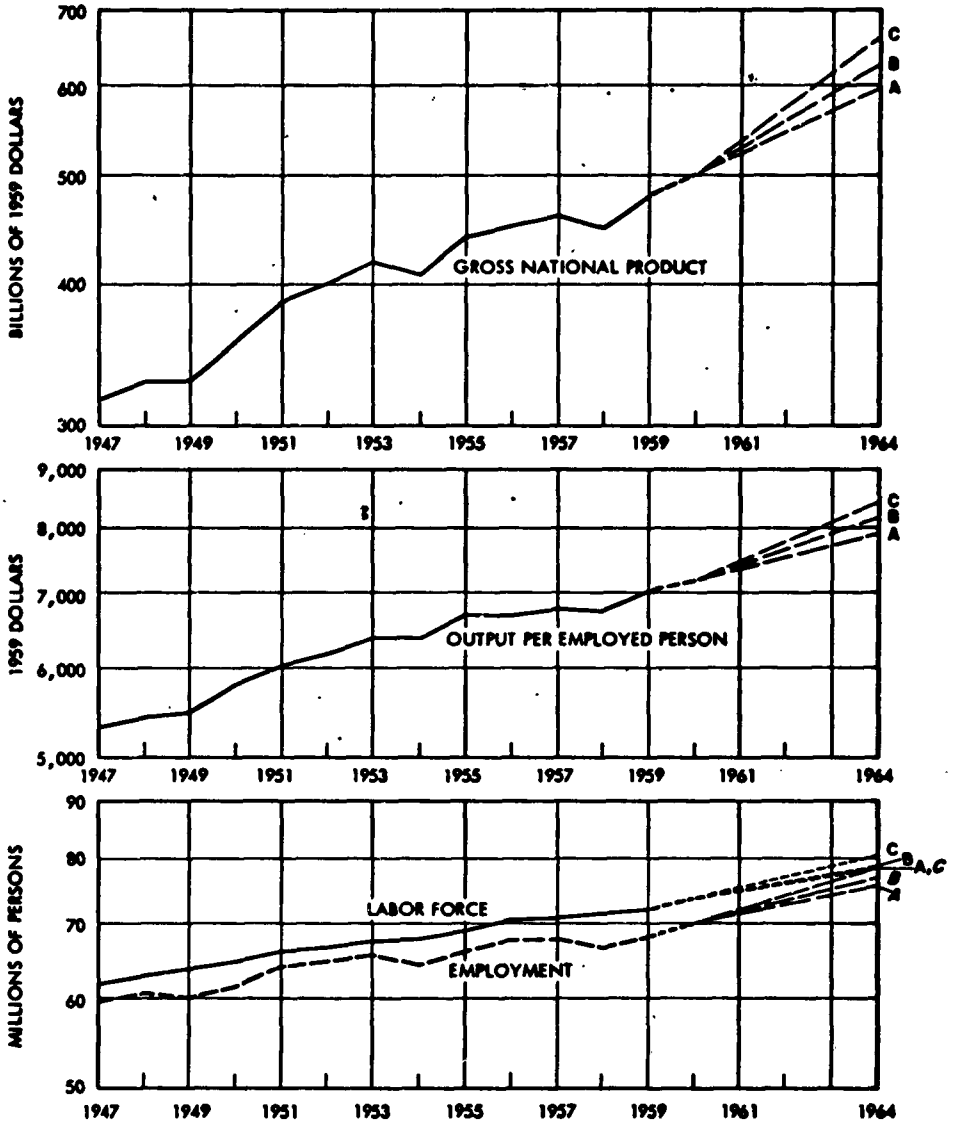
Feasibility of the Projections

We have demonstrated the feasibility of the projections in terms of the availability of manpower and its productivity. The principal problems of their feasibility, in terms of the institutional framework of our economy, are considered in Chapter 5.

We have taken care to make reasonable peacetime assumptions about each of the factors of resource utilization explicit in our analysis--labor force participation, unemployment, average weekly hours, and output per man-hour. But it may be argued that our precedents involved wartime conditions under which the population accepted many things and responded

FIGURE 12

GROSS NATIONAL PRODUCT, OUTPUT PER EMPLOYED PERSON, LABOR FORCE, AND EMPLOYMENT, 1947 - 59, ESTIMATE FOR 1960 AND PROJECTIONS TO 1964



SOURCE: Table XIII.

LEGEND FOR FIGURE 13

FROM INCREASE IN POPULATION (Over 14 Years of Age)

FROM INCREASE IN LABOR FORCE PARTICIPATION RATE

FROM INCREASE IN LABOR FORCE

FROM INCREASE IN EMPLOYMENT RATE (Means Decrease in Unemployment Rate)

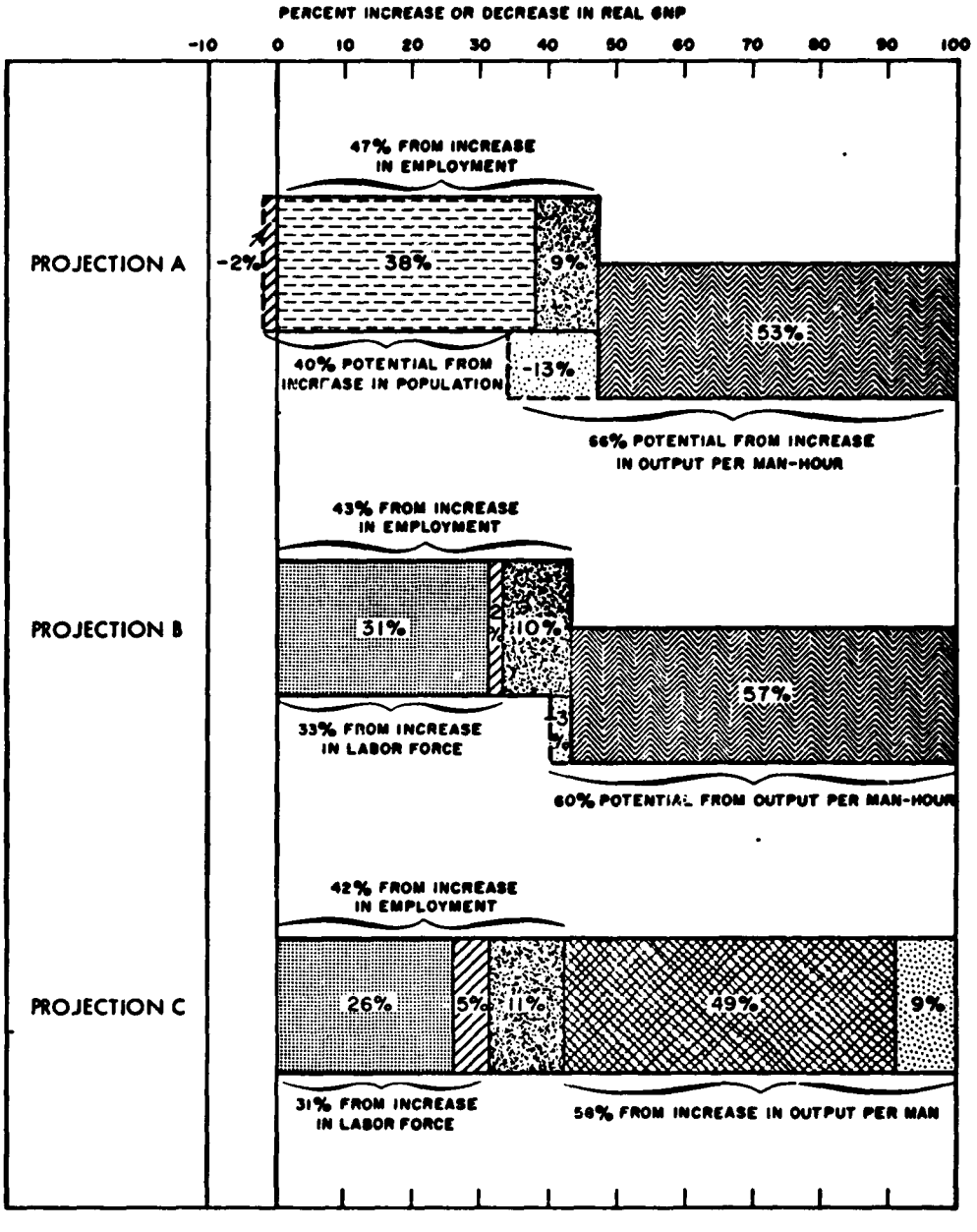
FROM INCREASE IN OUTPUT PER MAN-HOUR

FROM INCREASE IN AVERAGE HOURS WORKED

FROM INCREASE IN OUTPUT PER MAN

FIGURE 13

SOURCES OF GROSS NATIONAL PRODUCT GROWTH
1960 - 64



SOURCE: Computed from Table XII, by method given in Appendix A.

to many calls that it would not accept or heed in peacetime. This, of course, is true. Our assumptions, however, do not place any demands on the public such as those associated with these precedents. Table XIV shows GNP's that would be developed by 1964 if the World War II and Korean rates of labor force participation, unemployment, and increases in hours of work are applied to the 1964 projected population over 14 and the 1960 base average work-week and output per hour. (For output per man-hour, we use the annual growth rates achieved by privately employed persons in both wars. This is proper, as our projections are for peacetime and so do not contemplate any massive drafts of manpower into the Armed Forces, which tend to reduce over-all productivity, see Table VIII, footnote 1.)

On this basis, the Korean factors produce a 1964 GNP of $643 billion. This is just halfway between Projections B and C, and it provides $16 billion more output than Projection B, even though the latter involves a GE/GNP ratio comparable to that of the Korean period. Thus, we have demonstrated that it will require considerably less intensive effort to repeat the Korean accomplishment--primarily because of the higher rate of increase of the working-age population in the 1960's than in the 1950's, and the assumed lack of a large military draft.

The World War II factors yield a GNP of $767 billion--$107 billion, or 16 percent, more than in Projection C, and enough to provide 74 percent more national security expenditure without further curtailment of other sectors. As intended, we have stopped far short of a real wartime level of effort.1/

It may still be argued that the public will accept restrictions on the growth of its consumption spending under wartime conditions but not otherwise. This too is true, but again we have demonstrated in this chapter that consumption, in toto and per capita, rises in each projection at least as rapidly as in prosperous times past.

On the other hand, it is also true that gains in a period of change are not equally shared. There may even be some individual losses. Increases in the labor force participation rate and the reduction of unemployment mean that some persons gain a great deal. Others lose, as, for

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1/ Even if we use the Table XII hourly productivity figure instead of those of the war periods, the effort (manpower and work-week increase) factors of those periods would yield GNP estimates of $747 billion and $634 billion, respectively, levels well above our C and B Projections.

Table XIV

SOURCES OF GROWTH (2a): PROJECTIONS TO 1964 WITH WORLD WAR II AND KOREAN PEAK MANPOWER FACTORS

	World War II Basis		Korean Basis	
	1964	Average Annual Change from 1960	1964	Average Annual Change from 1960
Employment				
1. Population over 14 (millions)	135.7	1.8%	135.7	1.8%
2. Labor force participation rate	62.0%	—	58.1%	—
3. Labor force (millions)	84.1	3.4%	78.8	1.8%
4. Employment rate	99.1%	—	97.2%	—
5. Employment (millions)	83.4	4.6%	76.6	2.4%
Productivity				
6. Output per man-hour	$4.02	4.2%	$3.97	3.8%
7. Average weekly hours	44.0	2.1%	40.7	0.2%
8. Output per employee (annual)	$9,197	6.4%	$8,394	4.0%
Gross National Product				
9. Real gross national product (billions of 1959 dollars)	$767	11.3%	$643	6.5%

Sources: Line 1: See Table VIII.
Lines 2 and 4. See Table VI.
Line 3. Line 1 times line 2.
Line 5. Line 3 times line 4.
Line 6. Rates of growth from Table VIII, footnote 1. The rate of growth of wartime private product per private employee is more nearly appropriate than GNP per employee because our projections do not contemplate a large draft. Using the data from Table XII (based on 1947–55) would yield GNP's of $747 and $634 billion, respectively.
Line 7. Rates of increase from Table VI. Hours of work are computed by applying these rates to the 1960 figure given in Table XII. As there has been a strong secular downtrend since the wartime precedents, it seems proper and statistically conservative to use the wartime relative increases rather than actual levels. Note that it is also conservative to take the World War II increase from 1940 to 1944 (2.1 percent a year) rather than the much higher rise (3.3 percent) from 1940 to 1943.
Line 8. Computed from lines 6 and 8. Note that the computation can start with output per hour times hours per week (times 52) or with the multiplication of the rates of increase; the two cannot be exactly reconciled because of rounding.
Line 9. Line 5 times line 8. Again, figures are not precisely reconcilable because of rounding.

example, the possibly considerable numbers whose disposable income is cut because their income gains lag behind the increases in tax rates (which may, in fact, be a factor in inducing a rise in the labor force participation rate); but this is a problem that can be at least ameliorated by care in the drafting of tax changes. It seems clear that consideration of new programs on their merits need not be inhibited by the belief that they would require civilian sacrifices.

Chapter 5

SPECIAL PROBLEMS OF RAPID EXPANSION

In the preceding chapter we have seen how, on the basis of historical experience and conservative assumptions concerning the impact that rising government expenditures will be permitted to have on total output, a substantial expansion of such expenditures by 1964 is feasible. There can, indeed, be no doubt of the capability of the U.S. economy to provide for a very substantial expansion of security programs over the space of a relatively few years and at the same time to produce more, rather than less, for the private market. It has been done before, it can be done again, and we have seen what dimensions of expansion are relevant to the period just ahead.

This feasibility analysis relates to the expansion of government programs in gross dollar terms (adjusted for price changes). It has not taken into consideration the composition of the programs that may result, the specific resources that may be required (other than manpower), or the probable effect of the expansion of government expenditures on costs and price levels. The effect of expenditures on total income as well as on specific demand-supply situations, costs, and prices will vary with both the composition of programs and the rate of expansion. However, we have attempted to keep the projections well below the limits of available resources by holding the assumed rate of buildup, net multiplier effect, and labor force, employment, hours, and productivity changes well below the limits experienced in the respective wartime periods. A given composition of government demand would undoubtedly result in troublesome bottlenecks, but these would be unlikely to slow the expansion below the projected rate; they have not done so in the past.

Policies To Effect Expansion

This finding of feasibility presupposes that the set of policies effecting such expansion will include, in addition to the central expenditure policy, such policies with respect to the use of fiscal, monetary, and other instruments of control as are needed to achieve the expansion consistently with other national objectives. Although there may be questions concerning the political feasibility of adopting such policies in the immediate future, the fact that the expansion itself is easily demonstrated to be economically feasible should eliminate this question as a political issue. Convincing demonstration of economic feasibility may

itself contribute significantly to the acceptability of the policies necessary to secure the indicated expansion under currently foreseeable circumstances. Without venturing an appraisal of political issues and administrative requirements, we can nevertheless assess the implications of the projected alternative expansions in terms of the policies found necessary in World War II and the Korean period. First, however, certain factors peculiar to these projections require attention.

In the first place, the net effect of increased government expenditures on income and output is conservatively estimated. The government expenditure level of $150 billion (Projection B) will approximate one-quarter of gross national product, only if GNP increases no more than as shown in our estimate. But if total resources are judged adequate to permit less restriction of GPE, i.e., to allow a higher effective multiplier, then total GNP and thus the tax base will be increased by a correspondingly greater amount. Revenues from existing taxes will be somewhat greater, and the need for higher tax rates will be somewhat less than is implied in the projections.

Second, the political setting of the projections is wholly different from that of either previous period (1940-44 and 1950-53). Here we are examining the capacity of the economy to expand, not under the demands of war, to which no limit can be assigned, but under the assumption of a rapid buildup of security expenditures to given levels, as a prelude to limited expansion thereafter, during continuation of peacetime or cold war. This difference has obvious consequences both for private speculative behavior and for public measures.

Fiscal and Monetary Policies for Steady Growth

The foregoing are the implications of the character of our projections and of the short-run nature of the abnormally rapid buildup to the alternative national security expenditures of $84 and $145 billion. These implications underscore the proposition that the projected expansions will be significantly less demanding than those during the Korean period and World War II, respectively. It would be a serious error, however, to suppose that these levels of expenditure can be attained without the need for any difficult governmental decisions. Even the modest Projection A entails decisions. The probability that such decisions will entail side effects of expansion, with respect to prices, taxes, the debt, and controls, will be greater in connection with the more ambitious expansions.

In the case of Projection A, the problem is not primarily one of containing side effects of GE expansion in pace with the indicated growth of GNP; rather, it is one of choosing policies that must be adopted if expansion of GNP occurs at a significantly slower rate than 4.5 percent a year. A fundamental consideration here is that the growth of the labor force is already largely determined for the period to 1964. The increase in output per employed person is subject to modification, most readily by changes in average weekly hours. Whatever the sources of demand, if total output (GNP) expands much less than in Projection A, the lower level of output will be reflected in a lower percentage of participation in the labor force, shorter weekly hours, or unemployment at a rate above that of 1959, which itself was above trend. More probably, it will be reflected in a combination of all three. Even with government expenditures growing at 4-1/2 percent, changes in monetary, credit, tax, and perhaps other governmental economic policies may prove necessary to sustain private demand at the 4-1/2 percent growth rate.

Problems of a Rapidly Rising GE/GNP Ratio

In the case of Projections B and C, we face problems of a very different sort. Under both projections, expansion of GNP would proceed more rapidly than the rate which would be supported by recent growth rates of employment and production, even after the employment growth is adjusted upward for the acceleration of labor force growth in the 1960's. And, particularly under Projection C, the ratio of GE to GNP would rise by 1964 significantly above the 1959-60 fraction. These are the two most important aspects to which we should refer in evaluating the implications of the projected expansions.

Expansion of government programs may proceed so rapidly as to outrun the capacity of the market system to make the necessary adjustments rapidly and safely through the price mechanism. If this occurs, direct controls[1/] may be called for, so that shortages and bottlenecks can be more promptly overcome and kept from impeding the government programs and from setting off a chain of price-cost reactions. Such reactions, going far beyond the changes needed to bring forth increased supply where needed,

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1/ The term "direct controls," sometimes shortened to "controls," is used here in apposition to "indirect controls" of a fiscal and monetary nature. Direct controls may include: allocation of materials or components; rationing of consumer goods; price controls; regulation of consumer credit; wage controls; etc.

could have lasting consequences, thus requiring subsequent adjustments in order to correct inequities that need never have developed. It becomes essential to distinguish between modest price increases, which effectively bring forth additional supply, and sharply advancing prices, which through speculation may actually temporarily reduce available supply, while distorting the structure of costs and incomes. It is impossible to say in advance precisely what problems of this nature might be encountered in a given situation, but it is entirely feasible to evaluate a projected rate of increase as probably causing more trouble, or less, than expansion during a specified period of the past.

It may be helpful to examine more closely why it is that a rapid rate of expansion puts pressure on costs and may result in strains on the price system. Suppose we wish to have a building constructed according to certain specifications and find that a contractor will handle it for $100,000. This might entail his completing the job in six months. Insistence upon completion in four months may necessitate drawing upon the higher-cost subcontractors who may be immediately available. It may also require working in bad weather or the giving of some premium pay for overtime work. All this may raise costs so that the contractor can afford to complete the job only for $110,000. If the building is to be constructed in two months the need for overtime pay is much increased, and the pressure of haste may pyramid costs rapidly; the contractor may with good reason demand $150,000 for the job. And if we demand that the job be done in one day we shall find it impossible; the cost will be infinite.

The problems of speed of adjustment are likely to be more formidable in the case of the economy as a whole--which must be the level of analysis here--than in the case of a single building. In essence the problem is that of drawing into production for government use resources that are otherwise engaged or are idle. This is complicated by the fact that the steps in a production process must usually occur in given sequence, rather than concurrently. As in the case of the single building, there is an optimum time for performance, that is, a time that will minimize costs or a length of time beyond which further reductions of cost will not be significant. The problem of sequences that cannot be telescoped is similar at the levels of the whole economy and of the individual building. While an individual contractor may be able to call up additional resources (subcontractors, materials, workers) with only slight increments in marginal cost, it may readily be seen that if a hundred, or a thousand, contractors attempt to do so simultaneously the amount that prices and costs will be bid up is substantial.

In summary, to do something in a hurry costs more and, in some sense at least, haste makes waste. To train ten million men for military service

over a ten-year period will be cheaper than to train them over a one-year period. Ten billion dollars of foreign aid may be translatable into more actual goods and services for the recipients if spent over two years than if spent over two months.

This does not necessarily mean that expenditures should not be made rapidly. In most situations it is better to have goods sooner than later. The cost penalties of more rapid defense buildups must be balanced against the gains from prompt fulfillment of foreign policy.

However, we must recognize another effect of a rapid change in demand, such as that created by increasing government expenditures to the range of $150 billion to $210 billion by 1964. Not merely is the overall level of costs affected but also the income distribution and possibly, thereby, incentives. While increases in return may be necessary to bring additional resources into production to meet the new demand, owners of resources already devoted to such production receive gains--what the economist calls "rent"--over and above what is necessary to secure their use. When bricklayers' wages are raised from $5 to $5.50, those workers already doing bricklaying receive a surplus, over and above what is necessary to induce them to lay bricks. Similarly, those in the aircraft, electronic, or missile industries may gain surpluses from increased governmental support of higher education.

To some extent one may consider these surpluses desirable, as incentives to others. The rents enjoyed by existing college teachers might lure students today into committing themselves to academic careers. But to some extent we may feel that "war profiteers" in defense buildups are socially undesirable and a discouraging example to the less fortunate whose work is also needed. In this case, we may wish to tax away the surpluses in such a way as to give a distribution of income which accords with our social sense of equity and yet does not interfere unduly with incentives to production. At some point, we may wish to impose direct controls and so infringe upon the freedom of price and wage incentives to allocate resources. It should be understood, however, that the need, real or imagined, for direct controls stems from the inability of the price system to accomplish rapid changes in allocation without income distribution effects that are generally considered to be socially undesirable. This inability stems from the administrative and political--not theoretical or conceptual--difficulty of coupling the price system with appropriate taxes and subsidies to bring about a desired income distribution.

Even if expansion of government programs proceeds at a rate sufficiently moderate that no great strains or distortions result and no

question of direct controls arises, it may yet be carried to a point where the public sector accounts for so large a fraction of total output that its financing becomes difficult. Here again, the difficulties are not due to any conceptual limits, but they are no less compelling for being of an administrative and political nature. A tax system can be devised to finance a government sector amounting to a full half of GNP, but it is difficult to imagine any Congress receiving the broad public support that alone would make such a tax bill enactable or, if enacted, enforceable. This is true even if expansion proceeds at a moderate rate; if expansion to so large a fraction of GNP is accomplished over a short period, such extreme use of taxation might be unwise as well as impracticable. Thus taxation may in any case have to be supplemented by deficit-financing, an aspect to be discussed below.

Taxes for Expansion

Our focus in considering the financing of these expansion programs is on federal expenditures. State and local spending has been assumed to increase only in line with recent behavior; it is in the federal budget that Projections B and C show the major expansion.

In analyzing the fiscal aspects of a federal expansion program, it is necessary to make a careful distinction between federal expenditures for goods and services (the series we have used up to now) and the federal budget expenditures, which include a number of other items. The largest category in the difference is interest on the federal debt. Next come veterans' benefits, grants-in-aid to the states, and several lesser categories. Transfer payments, such as Social Security payments, which are "self-financing" out of special, earmarked taxes, are not included in either series. Table XV shows the budgetary expenditures for both federal and state and local governments, as well as the expenditures-for-goods-and-services series which we have been using up to now because it indicates the actual resource use by government. Currently, "transfer-type" expenditures raise total tax requirements roughly one-quarter above the amount needed for the government share in the national product. This quarter is matched by payments to the private sector without any direct reciprocal movement of real resources.

The increases that we have been projecting for 1964 are entirely in goods and services. Table XVI indicates also the trends of federal expenditures that are not for goods and services. These have been rising strongly since World War II, but the increase in grants-in-aid to the states, plus inflation, have been sufficient to account for all the growth since 1955. Accordingly, we have allowed for some continued growth in grants-in-aid,

Table XV

GOVERNMENT EXPENDITURES AND REVENUES
Selected Years and 1964 Projections
(1944, 1953, and 1959 in Current Dollars; 1960–1964 in 1959 Dollars)

	(1) World War II (1944)	(2) Korea (1953)	(3) 1959	(4) 1960 (estimated)	1964 Projections: Pay-As-You-Go Basis (5) A	(6) B	(7) C	Deficit Increases[1] Proportionate to GNP Growth (8) B	(9) C	Taxes after Deficit (10) B	(11) C
	Billions of Dollars										
Government Expenditures for Goods and Services	$ 96.6	$ 82.6	$ 97.0	$100	$110	$120	$210			$	$
Federal	89.0	56.0	53.0	54	63	93	133				
State and local	7.6	26.0	44.0	46	57	57	57				
Budgetary Expenditures[2]	100.1	90.0	121.1	120	140	160	240				
Federal	94.5[3]	70.1	73.7	70	81	113	173				
State and local	5.6[3]	27.0[3]	47.4	50	67	67	67				
Revenues[2]	53.6	66.2	113.1	122	140	176	236			156	211
Federal	43.6[3]	52.0	73.2	80	90	121	181	($30)	($36)	101	156
State and local	10.0[3]	24.4[3]	39.8	42	86	86	86			86	86
Gross National Product	211.4	365.4	478.8	500	806	827	869				
	Percent of GNP										
Revenues	28.3%	24.2%	23.6%	24.4%	24.3%	20.1%	28.7%			24.9%	21.8%
Federal	20.6	17.5	15.3	16.0	15.1	19.3	27.4	(3.3%)	(3.9%)	16.1	23.8
State and local	4.7	6.7	8.3	8.4	9.2	8.8	8.3			8.8	8.3
	Index Numbers of Percentages: 1960 = 100										
Revenues	106	99	97	100	100	115	146			103	130
Federal	170	110	96	100	94	121	171			101	147
State and local	86	88	99	100	100	108	99			108	99

1/ Federal debt, $290 billion in 1960, growing at 5.0 percent a year for B, 7.2 percent for C ($0.058 \times 290 \times 1.058^5 = 20.0$; $0.072 \times 290 \times 1.072^5 = 28.7$).
2/ Federal grants-in-aid to states eliminated from federal expenditures and from state and local revenues.
3/ Fiscal years.

Sources: Government expenditures for goods and services, see Tables III and X. Budgetary expenditures and revenues, Economic Report of the President, 1960, Tables D-51 and D-56. Percentage and index numbers computed. See text for account of 1964 projections.

Table XVI

FEDERAL EXPENDITURES FOR GOODS AND SERVICES VS BUDGETARY EXPENDITURES
1939–1960 and Projections for 1964
(Billions of Dollars)

Year	(1) Federal Expenditures for Goods and Services	(2) Budgetary Expenditures[1/]	(3) Budgetary Expenditures minus GE	(4) Grants-in-Aid to States	(5) Budgetary Expenditures minus GE and Grants-in-Aid
1939	$ 5.2	$ 8.9	$ 3.7	$0.9	$ 2.8
1940	6.2	11.2	5.0	0.9	4.1
1941	16.9	23.7	6.8	0.9	5.9
1942	52.0	56.7	4.7	0.9	3.8
1943	81.2	87.7	6.5	0.9	5.6
1944	89.0	97.7	8.7	0.9	7.8
1945	74.8	79.4	4.6	0.9	3.7
1946	20.6	41.1	20.5	1.1	19.4
1947	15.6	37.9	22.3	1.7	20.6
1948	19.3	35.6	16.3	2.0	14.7
1949	22.2	41.1	18.9	2.2	16.7
1950	19.3	37.7	18.4	2.3	16.1
1951	38.8	56.3	17.5	2.5	15.0
1952	52.9	70.7	17.8	2.6	15.2
1953	58.0	73.0	15.0	2.8	13.2
1954	47.5	64.9	17.4	2.9	14.5
1955	45.3	66.1	20.8	3.0	17.8
1956	45.7	67.2	21.5	3.3	18.2
1957	49.4	71.7	22.3	4.1	18.2
1958	52.2	75.8	23.6	5.4	18.2
1959	53.6	80.3	26.7	6.6	20.1
1960[2/] estimated	54.	80.	26.	6.6	18.9
1964[2/]					
Projection A	62.	90.	28.	9.	19.
Projection B	93.	121.	28.	9.	19.
Projection C	153.	181.	28.	9.	19.

1/ Calendar years are averages of successive pairs of fiscal years, for 1939–45 in column 2.

2/ In 1959 dollars.

Sources: Economic Report of the President, 1960: column 1, Table D-1; columns 2 and 4, Tables D-54 and D-56; some of column 4 also from U.S. Income and Output, Dept. of Commerce, 1958, Table III-1.

of taxes, including, in order of importance: individual income taxes, corporation income taxes, excise taxes, and all other receipts. The percentage of GNP may be taken for our present purposes as a rough measure of the "average" rate of these taxes as it varies over time.

Our first projection of federal revenues has been made on the assumption that the programs projected for 1964 would be financed entirely out of taxes, as shown in columns (5), (6), and (7), which we have labeled "Pay-As-You-Go Basis." On the last line of the table, the impact of this assumption is shown by the use of an index of the ratio of federal revenue to GNP, with 1960=100. That is to say, we have used the present average level of taxation as our standard.

It must be pointed out that the increase from 96 in 1959 to 100 in 1960 does not indicate any change in the tax structure, but rather reflects the greater yield of given taxes, as GNP and the rate of utilization of capacity rise. Offsetting this factor, the six-point decline in 1964 under Projection A reflects the fact that, in this projection, federal expenditures do not rise as rapidly as GNP (or national income).

Carrying out the programs in Projection B entirely from taxes would require total federal, state, and local taxes that have an impact 15 percent greater than those presently in effect, although federal taxes would have to rise 21 percent. (Again, actual rates would increase somewhat less, since we have not allowed for the increasing yield of the present tax structure, as corporate profits and average individual incomes rise when GNP rises and resources are more fully employed.) The 21 percent increase in federal taxes required to finance Projection B without deficits is more than double the increase required to return to the Korean (1953) relative level, and just over halfway from the Korean to the World War II level. But those were not pay-as-you-go precedents; 1953 federal expenditures were 14 percent deficit-financed, and 1944, 57 percent.

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revenues and GNP, and between revenues and national income, for the periods 1939-59 and 1954-60 (1960 estimated), show no significant differences. We use GNP as the base, therefore, so as to have the convenience of consistency with other parts of our analysis. Note that this is the equivalent of using national income and assuming no change by 1964 in its relation to GNP, i.e., essentially that allowable depreciation and the indirect business tax structure are not altered. (Since 1954, national income has varied between 82.9 and 83.6 percent of GNP; there has been no discernible trend, and the 1959 percentage was 83.2.)

The burden of the programs of Projection C, here reflected in pay-as-you-go tax rates, is highlighted by the required rise of 46 percent from the present tax rate structure, and 71 percent for federal taxes alone.

Onerous, and perhaps politically impossible, as these tax increases may appear, it should be remembered that they no more than pay for the government expenditures. By definition, they leave the hands of the people, as a sort of national "take-home" pay in real resources, the amounts which the projections show for gross private expenditure, and it will be recalled that in both Projection B and Projection C, GPE increased annually. The alternative of deficit-financing means greater forced savings, either through direct controls, baby bond drives, etc., or inflation.

It would probably not be politically feasible to raise taxes by these magnitudes before any deficits have been incurred. Nor would it be desirable to institute too precipitously the psychological adjustments that a major restructuring of taxes would require. There would be a risk that an attempt to prevent any deficits would be marred by misjudgments in the prediction of tax requirements, possibly resulting in excessive adjustments that would actually dampen the growth essential to the carrying out of the program objectives.

We cannot attempt here to delineate an ideal formula, nor even to predict the precise formula that might be adopted if the assumptions of our alternative projections came true. We have, however, attempted to establish one possible benchmark for partial deficit-financing. The present federal debt of approximately $290 billion amounts to 58 percent of the estimated $500 billion GNP for 1960 (1959 prices), reflecting a relative reduction of more than one-half from the situation in 1945, when $279 billion of debt represented 130.5 percent of GNP (current prices). Interest on the debt was $7.7 billion in 1959, representing 1.6 percent of GNP, compared with $4.3 billion, or 2.0 percent, in 1945. Thus, whether judged in terms of its relative amount or of its significance for the current budget, the federal debt in 1959 was significantly lower than the amount carried at the end of World War II.

The historical fact that the federal debt has been successfully carried at substantially higher relative levels than at present somewhat eases the problem of considering the financing of expansion of the dimensions projected. If it appears either unrealistic or undesirable to increase taxation to cover the projected increase of expenditures fully, the alternative of loan-financing is plainly available. On the other hand, substantial reliance on borrowing would imply credit restrictions and other, more direct, controls to keep private demand from pressing too hard on supply.

If the federal debt is allowed to grow at the same annual rate as the gross national product, it will not constitute any more burden, in relative terms, than it does today. Such growth, while somewhat inflationary, would facilitate the provision of an expanding money supply during a period of rapid growth and would permit price changes needed to reallocate resources (as will be discussed in the next section).

The supply of money--currency and demand deposits--is currently near $140 billion, or almost one-half the size of the federal debt. For the money supply also to grow proportionately to GNP would constitute a reasonable condition for relative price stability. Monetization of about half the projected increments in the federal debt (i.e., permitting their use as bank reserves) would provide the needed increases in the supply of money. The other half of the debt increments could be sterilized (i.e., not permitted to be used as bank reserves, where they form a basis for increased money supply).

These proportions are illustrative only. The policy should remain flexible, striving to permit just that degree of price increase needed to facilitate the reallocation of resources to the national purposes but not allowing any greater increases, which would effect other reallocations that would impede the national programs.

Monetary policy has not been used in the past to restrict emergency expansion. It can be a powerful tool to this end. Its use would reduce the requirements for direct controls. This is not to say that direct controls would never be needed. We conclude later in this chapter that they would probably be required in Projection C. Containment of the supply of money does not prevent increases in the velocity of money when demand is stimulated, and it is this phenomenon that makes a combination of monetary and direct controls (and tax policy) requisite for control of inflation and effective implementation of large government programs.

In columns (8) and (9) of Table XV, the figures in parentheses show the amounts by which the debt would grow in 1964, if it were allowed to rise at the same rate as GNP under Projections B and C. These figures, $20 billion and $26 billion, respectively, are not inconsiderable.[1/] They would permit the reductions in required federal taxes shown in columns (10) and (11). As the index of taxes as a proportion of GNP shows, no significant increases in tax rates would be required to carry out

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1/ See Table XV, footnote 1 for derivation.

Projection B. If the federal debt remained at 58 percent of GNP, a tax increase of only 30 percent, instead of 46 percent, would be required to carry out the programs in Projection C; federal taxes alone would need to rise 47 instead of 71 percent.

We are not here advocating a particular level of taxation. Both our "after-deficit" examples imply that 9.5 percent of total governmental (budgetary) expenditures be deficit-financed--about equal to the Korean peak but only a small fraction of the 64 percent at the World War II peak (fiscal 1943). A wide range of mixes of taxes, monetary policies, direct controls, and inflation can be considered as acceptable without negating the feasibility of the projections, even though the reader and the author might consider some combinations more sensible or more desirable than others.

These estimates of the required increases in taxes are probably somewhat higher than would actually prove to be the case, for two reasons: (1) if there are no changes in the given tax structure--by law or interpretation, or by individual and corporate policy in minimizing tax liabilities--then proportionate returns may be expected to rise as GNP and the utilization of capacity (or "potential") increase, i.e., the tax structure has an "elasticity greater than one"; and (2) any continued inflation, even at the moderate rate of the late 1950's, which we have excluded by using 1959 dollars, would tend to enhance the above effect.[1/]

We need not consider here the specific tax programs that might be undertaken to raise all or part of the cost of these large programs. It is entirely probable that increases in the rates of given taxes, or the imposition of new taxes, could be partially forestalled by reforms in the existing tax structure. To the extent that inequities in the tax structure tend to promote waste in the economy, their elimination would make a positive contribution to the completion of the projected programs. This could take the form of increases in the private sector, above those projected, or of decreases in the required inputs of man-hours or

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1/ One authority states: "Total Federal Taxes, in the aggregate, react more than proportionately to inflation. The yield from the personal income tax appears to rise at 1.5 times the rate of price increases." (The remaining revenue sources react, in the aggregate, about proportionately.) Otto Eckstein, Trends in Public Expenditures in the Next Decade, Committee for Economic Development, New York, April 1959, p. 8.

productivity increases. Tax law revisions to encourage investment, and also at least temporarily to discourage consumption, would speed accomplishment of large programs and would reduce the need for, or threat of, controls.

It may even be that government programs of the magnitude of those in Projection B, and particularly those in Projection C, the acceptance of which would imply that the nation as a whole was convinced of their overriding urgency, would increase recognition of the need for such tax reform and thus enhance the political feasibility thereof.

Whatever their form, and even if reforms increase their efficiency, the fact remains that the taxes implied in Projection C, and even in Projection B, are indeed high. (Nevertheless, we must remind the reader that this study has dealt with expenditures for goods and services, so that GPE is by definition "after taxes.") But we must give attention to an additional argument about the level of taxes. It is frequently asserted that we are at or near the limits of feasible taxation.

The infeasibility of increasing taxation has been argued by Colin Clark, who for many years has maintained that 25 percent of national income (20-22 percent of GNP in the United States) is the most that any government (including all levels) can take from any economy.[1/] (This level has, of course, already been exceeded for a protracted period in the United States and many other countries.) Most recently, Peter Drucker has repeated the argument, hedging Clark's 25 percent by placing the figure at "one-quarter to one-third."[2/] Francis M. Bator points out that in the nineteenth century an English economist, Bastable, put the critical level at 15 percent.[3/] Perhaps it is a function of time--whatever is happening at the moment looks to some like the limit of the possible.

We cannot here enter fully into the issues of fact and theory involved. The arguments for the proposition of the infeasibility of additional taxation fall in two categories. First, higher taxes are said to kill incentives (to work, to make profits, to be efficient and economical).

1/ See, for example, Clark's contribution to Limits of Taxable Capacity, Tax Institute, Inc., 1953.

2/ Harper's Magazine, July 1960, "Three Unforeseen Jobs for the Coming Administration," p. 49.

3/ Francis M. Bator, The Question of Government Spending, Harper & Brothers, New York, 1960, p. 50.

Closely related is the contention that they are inflationary. Second, higher taxes are believed to become increasingly uncollectible. A third category might be added, but it is not an argument of economics: the public will simply not stand for more taxes--their enactment is politically infeasible.

Let us consider these arguments, very briefly. For the most part they have been asserted but not verified empirically. Bator's book effectively summarizes the statistical evidence against Clark's thesis and the arguments against the conclusion, on whatever grounds, that there is a ceiling above which taxes cannot go.1/

We are told that executives in the high tax brackets have no incentive to make more; often we are told this by executives in the high brackets who are striving for promotions that will put them in higher brackets. It is said that high taxes make it not worth-while for wage earners to work overtime; but the history of the average work-week which we traced in Chapter 3 shows that the downtrend has been slow and steady. It also shows a short-run increase in response to every improvement in the level of business, i.e., in response to strong demand for overtime work.

It can be argued on the other side that higher taxes which decrease take-home pay or corporate profits may make employees or executives work harder to keep their incomes up. "Moonlighting" on second jobs may be affirmative evidence.

The point is, examples and arguments on each side of the fence are easy, but there have been few real studies of tax incentive and disincentive effects, and these suggest that there have been disincentives to work ever since the Garden of Eden but that there is little evidence that taxes are a significant one or that higher taxes would be.2/

1/ Ibid., pp. 43-62.

2/ See papers by G. F. Break, Crawford H. Greenewalt, Peter Henle, and Clarence D. Long, in Federal Tax Policy for Economic Growth and Stability, Joint Committee on the Economic Report, GPO, 1955; G. F. Break, "Income Tax and Incentives to Work: An Empirical Study," American Economic Review, September 1957, and "Income Taxes, Wage Rates and Incentives to Supply Labor Services," National Tax Journal, December 1953; T. H. Sanders, Effects of Taxation on Executives, Harvard Business School, Boston, 1951

Moreover, the argument that taxes have reached their limit because of disincentive effects is a static one, in that it assumes implicitly that additional taxes must be of the same form as present ones. We have already pointed out that tax reforms are needed and that higher government requirements would reinforce this need. And it may be that additional taxes should be of new forms rather than additions to the personal and corporate income taxes. We indicate in Chapter 6 that under some conditions consumption or expenditure taxes may in any event serve the national purposes better than income taxes.

If higher taxes in fact offer disincentives and cause inefficiencies, then they may have an inflationary influence, since the presence of these side effects means that the taxes are likely to constrict supply more than they do demand. We have already pointed out the lack of evidence of effective disincentives. We would not question that there are serious examples of inefficiency and waste induced by income taxes. Abuses of the expense account are probably the outstanding example. These can--and should--be corrected by tax reform, with or without increases in level. One may be permitted to doubt, however, whether their net effect is of a magnitude to be weighed against the need for higher taxes (again, not necessarily income taxes) to meet government programs that may be collectively determined to be in the national interest.

But more importantly, the relationship between taxes and inflation is determined by other issues. First and foremost is the ratio of taxes, or total revenues, to expenditures. The difference between the two is surplus or deficit. There is no dispute that, other things being equal, significant deficits are inflationary (and surpluses deflationary). Other things are seldom equal, however. The inflationary pressure of a deficit varies greatly with the degree of slack in the economy. The pressure can also be greatly affected by the monetary policy followed, and even, under some conditions, by the supplementary use of temporary direct controls.

The second general line of argument is that higher taxes would prove uncollectible. Drucker asserts that the states and local governments cannot get more revenues unless they invade traditionally federal sources, and vice versa. "This is not just a problem of power. There simply is not enough money to go around, even if the national income rises considerably faster than it did in the Fifties."1/

1/ Loc. cit.

Just why this should be so is not clear. What is all the common talk of "closing loopholes," if it will not increase revenues, to some extent at least, from existing taxes? More importantly, why are given tax rates the highest that can be levied in any particular category? There is wide variation among the rates of state income taxes, of state and local sales taxes, of real and personal property taxes. Can each (including the cases where the rate is zero) represent the true limit? If not, how can their aggregate? And why can new sources not be tapped?

We might note that higher taxes have been collected in the past, as we have seen in our review of World War II and Korean history. It is interesting that heaviest reliance at those times was placed on raising the rates of the personal and corporate income taxes--and that the increases that survived intact were the new or increased excise taxes.

The argument about collectibility sooner or later goes from the economic to the political. "Any increase must, substantially, come from people earning less than the average family income of $5,000--probably through sales taxes. Popular support for such a policy in peacetime is unlikely, to put it mildly."1/ Drucker has not demonstrated the two dubious economic propositions that "any increase must come from people earning less than the average . . ." and (implicitly) that new revenues from sales taxes would come from those with below-average incomes. And certainly he has not demonstrated the political proposition that new sales taxes are unlikely to get popular support in peacetime. Sales taxes proliferated during the Depression. They may not have been "popular," but they were, a posteriori, politically feasible (as well as being one of the most collectible of taxes). As for excise taxes--there was hardly a murmur when the 86th Congress, 2d Session, declined again to lift the "emergency" federal excise taxes on transportation and telephone calls.

We do not want here to pursue the political questions involved; it is the objective of this paper not to advocate any programs but to clarify certain economic issues, so that errors of fact or understanding about them shall not be used as political weapons to oppose programs that must be considered on their merits.

1/ Drucker, loc cit.

The Role and Cost of Price Increases

Reference has more than once been made to the need for diverting demand from the private sector to match the shift of output to government programs. Unless there is such diversion of demand, the shift of output can be accomplished only through the government's outbidding private buyers by paying higher and higher prices. Given such diversion, on the other hand, prices may come under little pressure, as the willingness of private buyers to bid against the government is weakened by the effect of taxes in limiting the expansion of their disposable incomes.

Mention has already been made of the danger that full use of taxes to accomplish the diversion runs the risk of damping the expansion, thus thwarting policy in achieving its basic objective.[1/] The desirability of permitting some general increase of prices may be linked to the need for permitting specific price increases as an essential feature of market adaptation to the changing composition of demand under the expansion of government programs.[2/]

Relative prices are usually expected to play an essential role in resource allocation. Increases in market demand for a commodity bring about increases in the price of that commodity which in turn induce producers to transfer resources to its production. Relative price and wage increases will be the incentive for the increased production necessary to meet increased government demand, and they will restrict nongovernment demand for the commodities and labor services affected. But it is not to be expected that such restriction of demand in certain sectors will cause a reduction of prices there. Hence, rising prices will not be offset by other prices registering declines, but the general level will move upward.

1/ This reasoning relies, of course, on the assumption that deficits mean higher prices. The quantitative relationship between deficits and price levels is not fixed, nor probably even generally predictable, since the effect will always have a time lag and will vary with the level of output relative to capacity. For an extended discussion on this issue, see Robert Eisner, statement before the Joint Economic Committee, Congress of the United States, Employment, Growth and Price Levels, Part 4--"The Influence on Prices of Changes in the Effective Supply of Money," GPO, 1959, pp. 767-844, especially pp. 801-4.

2/ Throughout this section, when speaking of inflation we shall have in mind inflation above trend. That is, we shall accept the probability of continued inflation in the economy without new causes. This does

It would be a mistake to regard rising prices in the sectors affected by government demand as necessarily indicating need for allocations or price control. This might or might not be the case. The objective in any event should not be to hold prices rigid, but to contain price rises from going beyond the levels necessary to expedite the transfer of resources.

Policy with respect to prices is seldom easily formulated under such circumstances. If speculative movements can be ruled out, much greater latitude can be taken than if speculation plays its usual role. A price "freeze" may be quite inescapable, as a feature of responsible policy, if the economy is to be protected from damaging distortions such as those that often follow a declaration of war. Yet, a price freeze is purely an interim measure.

The most challenging duty that faced OPA, after the General Maximum Price Regulation was issued early in 1942, was to develop formulas for adjusting ceiling prices so as to take due account of the underlying cost changes and to safeguard the continued supply of goods that were needed in increasing volume. "General Max" was not a substitute for the market, but a temporary means of safeguarding the market from unnecessary price increases, increases that brought forth no additional supply and served only to increase costs elsewhere. The regulation was continually modified to permit increases that were necessary to the market's satisfactory functioning.

It is instructive in this connection to trace the movement of prices during the period 1940-44, as both GE and GNP expanded at unprecedented rates. At the wholesale level, prices rose 11 percent between 1940 and 1941, while GE, in 1959 prices, increased 53 percent. In 1942, while

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not imply approval of the trend, nor any thought of minimizing the need to control it. But it would be unrealistic in our analysis not to recognize the familiar phenomenon, often described as "cost-push" inflation, or a combination of cost-push and demand-pull. We shall not digress here to give our attempt at the "correct" analysis, nor even to describe the familiar inflexibilities of pricing and wage negotiation which underlie the cost-push concept. We shall simply recognize the trend (which we have eliminated by using 1959 prices) and confine our discussion to additional inflation which might be ascribable to large government expenditures and their accompanying fiscal and monetary policies. We associate the trend with Projection A; the problems of increment above trend, with Projections B and C.

GE increased 110 percent, the price rise was held to 13 percent, little more than in 1941. In 1943, with GE increasing in absolute terms more than two-thirds as much as in 1942, but by only 38 percent, prices rose only 4-1/2 percent. And in 1944, as GE increased 10-1/2 percent, prices rose only 1 percent. The following tabulation presents the data and also shows that a similar story is told if one uses the retail prices or the more general "implicit price deflator for GNP."

Year	Government Expenditures on Goods and Services (GE) (billions of 1959 dollars)	Percent Increase from Preceding Year			
		GE	Wholesale Price Index	Consumer Price Index	Implicit Price Deflator for GNP
1940	$ 37.7	--%	--%	--%	--%
1941	57.7	53.1	11.2	8.2	5.0
1942	121.2	110.1	13.0	12.6	10.8
1943	166.9	37.7	4.4	9.0	6.2
1944	184.2	10.4	0.9	2.5	1.7

These comparisons are offered, not to demonstrate--as they do--that against even such tremendous pressures as developed during World War II, stabilization measures can be highly effective in controlling prices, but to indicate two key aspects of the regulation of prices, which was first broadly effective in 1942: (1) that such regulation was tempered to permit and encourage the expansion of output; and (2) that it required less tempering, as resources became more and more fully mobilized.

Neither Projection B nor Projection C will put the economy to any such test as that during World War II. Indeed, Projection B should require no controls at all unless on a stand-by basis and to discourage speculation.[1/] But if pressures requiring controls should develop, as could be expected under Projection C, here too there must be recognition of the role of price increases--contained, but not rigidly prevented--in facilitating the expansion desired.

1/ We refer here to general direct controls--allocations, rationing, and price regulation. One can easily imagine particular government programs that might require allocation of certain scarce items--say, special metals or components of unique value in some type of military hardware.

In very sketchy fashion, the preceding paragraphs indicate why, given a relatively rapid expansion, some increase of prices must be expected. Put in simplest terms, the price system is an efficient method of effecting the required transfer of resources; therefore, in protecting the economy from speculative forces and from a general excess of demand, it is important not to prevent prices from doing their basic job.

As with everything else, however, getting the job done has its cost. The cost here is not the higher level of prices at the end of the expansion, but the growing inequities in the distribution of income as prices rise. These inequities are sometimes much less serious than is imagined, but the fact remains that there are groups in the population that are unfairly treated, are unable to protect themselves, and have clear claim to redress.[1/] Ideally, this would be accomplished through taxing away the windfall gains accruing to those who benefit from unnecessary price increases, and transferring them to the genuinely disadvantaged members of the community. This is more easily said than planned, however, and more readily planned than enacted. Indeed, it is likely that the measures proposed to prevent inflation will be of broad character, designed to absorb an aggregate volume of general purchasing power without regard to where it is accumulating.

If, to avoid the inequities resulting from a general increase of prices, a lowering of income tax exemptions were proposed, it is debatable whether persons over 65, living on pensions, would be better off without the price increase. If the alternative were effective taxation of capital gains, the balance of considerations would be quite different. Or if, to avoid inflation, the expansion of certain government programs were offset by reductions of others, there would result still another set of comparisons.

One can hardly be against the income redistribution brought on by inflation, unless one is clear as to the distribution that would obtain without inflation. And this requires a clear specification of the set of conditions that would prevail if measures to avoid inflation were taken. It may be that the course of wisdom is to take such measures against inflation as will neither repress expansion nor yield greater inequities than would result from rising prices, and to recognize the need, after the period of expansion, of special remedies for such inequities as are nonetheless incurred.

1/ Cf. end of Chapter 4 and end of section Problems of a Rapidly Rising GE/GNP Ratio, earlier in this chapter.

When Would Direct Controls be Needed?

Turning again to Projections B and C, we note first of all that they represent the expansion of GE to 24 percent and 32 percent, respectively, of GNP (Chapter 4). The former ratio is that attained in 1953.[1/] The latter exceeds this substantially, but falls even more substantially short of equaling the ratio of 46 percent that was reached in 1944. (The ratio in Projection C is roughly equivalent to the estimated 1959 relative level of effort for the same functions in the Soviet Union.) We may realistically view these ratios as upper limits, in light of the implications, already noted, of the conservative character of these projections of GNP. Equally significant is the comparison of the rates of expansion embodied in the two projections with those of 1950-53. As we have observed, GE increased at 15.4 percent and GNP at 5.3 percent annually during that period. Under Projection B, these rates would be 12.2 and 5.8 percent, respectively. Under Projection C, they would be 28.2 and 7.2 percent. Thus, Projection B would entail a rate of increase somewhat less in the case of GE and about the same in the case of GNP. Under Projection C, the increase of GE would be at nearly double the Korean rate and the GNP rate would be roughly one-third greater than during that period.

The clearest case for the introduction of allocation and other direct controls during the Korean period lay in the fact that no one could say how serious the conflict would become or what rate and extent of increase in the defense program would be necessary. It is arguable that the allocations system would not have been necessary had it been clear from the outset that the expansion of defense requirements would develop no faster and go no further than actually occurred.

The experience during the steel strike of 1952 may be cited as an example. There was at that time a Controlled Materials Plan (CMP),

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1/ Note again that this is in 1959 dollars. The ratio in 1953 was 22.6 percent (GE/GNP), but to achieve the same relative allocation of resources today would require a ratio of approximately 24 percent. The fiscal problems of allocating 24 percent of GNP to GE are presumably greater than those allocating 22.6 percent; this is, indeed, one of the effects of the greater increases in the prices of goods and services purchased by government than of those bought by the private sector. If one is focusing on monetary rather than "real" resources, the appropriate basis for measurement is current rather than constant dollars.

covering the allocation of steel, copper, and aluminum. There was much talk about impending shutdowns of defense and civilian enterprises all over the country. It was even warned that the Great Lakes would freeze up before sufficient ore could be shipped in to keep the mills going in the winter, after the strike was over. The strike lasted 51 days--more than 7 weeks--before inventories were seriously depleted in a few specialized lines and shutdowns were actually starting. At this point the strike was settled. Inventories across the board had turned out to be much greater than believed or claimed, just as they did during the 116 day strike in 1959. Much of this stock had been accumulated under the CMP, when, despite the protests of the claimant agencies that allocations were inadequate, the Requirements Committee had been allocating steel more rapidly than it was being "chewed up."

It might well have been possible, then, to have permitted even more rapid growth of private expenditures and thus of total GNP during the Korean period.

On the basis of this experience, it does not appear that direct controls, other than possible allocations of minor bottleneck items, would be needed to carry out Projection B; stand-by controls might be politically necessary, might help to contain speculation, and would allow a margin for error without risking essential programs.

Under Projection C, however, direct controls would probably be called for, unless--and perhaps even if--government expenditures were fully met out of taxes from the outset. If direct controls were more fully utilized than during the Korean period, they could be expected to meet the requirements of the situation. Nothing comparable to the 1940-44 period, when GE increased at an annual rate of nearly 50 percent, would be experienced under our projections.

International Balance of Payments

The balance of payments of the United States has recently been a subject of intense interest both in this country and abroad. This is true in part because the United States experienced balance of payments deficits almost continuously from 1950 on, and especially severely in 1958 and early 1959, resulting in an unprecedented outflow of gold. Also, the balance of payments of the United States, the various transactions that are reflected in this balance, and the policies we pursue respecting it have a very important impact on other countries. It seems generally to be agreed that the United States cannot and should not continue indefinitely to sustain the 1959 deficit level of some $3.8 billion, and

particularly the outflow of gold which in 1958 reached $2.3 billion, but it also seems clear that some deficit is supportable and even desirable if world trade is to expand. It is also generally agreed that certain policies which might alleviate the balance of payments deficit, such as increased import barriers or a sharp reduction of foreign assistance programs, are not consistent with a foreign policy that emphasizes expanded world trade and economic development.1/

It is desirable, therefore, to examine the projections in Chapter 4 in terms of their implications for the U.S. balance of payments. In particular we will consider the extent to which the projected increase in output and government expenditures will facilitate or complicate efforts to carry out acceptable policies for adjusting the balance of payments deficit and expanding foreign trade.

A country's balance of payments is a statistical record of all its financial transactions with the rest of the world. As can be seen from Table XVII, the major dollar component of the U.S. balance of payments is our merchandise trade with the rest of the world--our exports and imports of goods and services. In the past decade, U.S. imports have provided approximately half of our payments to foreigners, and our exports, two-thirds of our receipts from foreigners. Historically, for many years, the United States has exported more than it has imported. Services have also contributed to net receipts by the United States until recent years, when the expenditures of tourists and military personnel abroad increased.

In the decade preceding 1959, the U.S. export surplus on goods and services averaged $2.9 billion in 1959 dollars. Even in 1958, when we had an over-all deficit in our balance of payments of $3.5 billion we had an export surplus of goods and services of more than $2 billion. The further increase in our balance of payments deficit in 1959 is acccunted for primarily by the reduction of our "favorable" balance of trade due to increased imports, a factor reversed during 1960.

The remainder of the balance of payments consists of long-term and short-term capital flows, both government and private, and other miscellaneous transactions. In the past ten years these transactions, including as they do U.S. foreign aid programs and U.S. private investment abroad, have increased substantially and have resulted in net payments by the

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1/ For a more complete discussion of the U.S. balance of payments deficit and alternative policies, see William B. Dale, The Foreign Deficit of the United States, Causes and Issues, Stanford Research Institute, April 1960.

Table XVII

U.S. BALANCE OF PAYMENTS
1958, 1959, and First Half, 1960
at Annual Rate
(Millions of Dollars)

	(1) 1958	(2) 1959	(3) 1960 (first half, annual rate)
Trade			
Merchandise exports	$16,263	$16,225	$18,972
Merchandise imports	-12,951	-15,315	-15,360
Balance of Trade	$ 3,312	$ 910	$ 3,612
Services			
Receipts	7,062	7,239	7,498
Payments	-8,102	-8,245	-8,436
Balance on Services	$-1,040	$-1,006	$ -938
Balance on Goods and Services	2,272	-96	2,674
Capital and Other Transactions			
Repayments on U.S. government loans	544	1,013	640
Foreign long-term investments in U.S.	24	548	672
Total Receipts	$ 568	$ 1,561	$ 1,312
Remittances and Pensions	-722	-779	-776
Government grants and related capital outflows	-2,427	-2,477	-2,948
U.S. private and other government capital outflows	-3,548	-2,818	-2,606
Total Payments	$-6,697	$-6,074	$-6,330
Balance on Capital and Other	-6,129	-4,513	-5,018
Net Errors and Omissions	380	783	-372
Balance of Payments	-3,477	-3,826	-2,516
Gold sales	$-2,275	$-1,075	$ -288
Other (increase in foreign liquid dollar holdings)	-1,202	-2,751[1]	-2,228
Memorandum Item: Goods and Services Transferred under Military Grants	2,281	1,988	1,700[2]

1/ Excludes $1,375 million for U.S. subscription to International Monetary Fund.
2/ Based on first quarter only.

Source: U.S. Dept. of Commerce, Survey of Current Business, September 1960, pp. 9 and 12, and June 1960, p. 14.

United 3tates to foreigners averaging $2.2 billion. Since 1949 the surplus in exports of goods and services has not been large enough to offset the net outflow resulting from capital transactions, except in 1957. Up to 1958, the resulting deficits in the balance of payments exceeded $2 billion only in 1950, when merchandise exports dropped sharply, and in 1953.

In 1958, however, a combination of record imports and sharply reduced exports from the very high level attained in 1957, brought a deficit of $3.5 billion in the balance of payments. More important, this deficit was financed by a gold outflow of almost $2.3 billion, the largest loss of gold ever experienced by any country in a single year. This demand by foreigners for gold rather than short-term dollar assets to finance balances with the United States caused concern that a loss of confidence in the dollar might be developing. This concern has abated as a result of the experience in 1959. Although the balance of payments deficit increased to $3.8 billion, less than 30 percent of the total ($1,075 million) was settled by gold flows. At the same time, foreigners increased their liquid dollar assets by $1.9 billion.

Now let us examine how our GE and GNP projections might affect the balance of payments. As has been noted above, a country's balance of payments is made up of a number of principal trade and financial elements, each of them affected by many factors, external as well as internal. Changes in these several elements sometimes counterbalance and sometimes reinforce one another, so that the net balance often changes abruptly, as did the U.S. balance in 1958. To the extent that market forces are free to operate through changes in interest rates and prices, the mechanism of international payments causes shifts in either direction, adverse or favorable, to generate countervailing adjustments. Under the circumstances existing today, large elements in our balance of payments are not sensitive to prices and interest rates--for example, foreign aid and military expenditures. Thus, the ability of the country to weather an adverse shift will depend essentially on two factors. One is the relative importance of foreign trade in its economy; the other is the relative size of its gold reserve available to make international settlements. With respect to both, the United States is in an exceptionally strong position, as is generally recognized.

Foreign trade represents only a small fraction of U.S. gross national product. At their peak, net exports totaled $9 billion, contributing about 3 percent to GNP in 1947. The next highest figure was $5 billion--less than 2 percent, in 1946. As to gold reserves, the United States still holds more than one-half the Free World's total supply. It is now apparent that in 1958 and particularly in 1959, while replenishing their

long-depleted gold reserves, foreign countries were also building up their dollar balances. Other countries appear now to be finding their own reserves approaching satisfactory levels. U.S. payments are currently being made, accordingly, largely in the form of dollar balances rather than gold. Whereas in 1958 gold was drawn upon to the extent of two-thirds of total net payments, in 1959 the ratio was less than one-fourth. Meanwhile, the annual excess of payments reached a peak in the first half of 1959 and was reduced in the last quarter of 1959 and the first two quarters of 1960 to an annual rate of about $2-1/2 billion.

Prior to 1958 it would hardly have been considered necessary, in connection with a study such as this, to examine the feasibility of domestic expansion in light of its implications for the U.S. balance of payments. Domestic expansion at a rate greater than that experienced by a country's trading partners normally must be expected to increase imports more than exports. During the long period of the "dollar shortage" such a tendency would have contributed to overcoming that shortage and would have reinforced U.S. policy in restoring the economic strength of Western Europe. With that stage of postwar development now ended, however, it is appropriate to consider whether the feasibility of such expansion as has been set forth in the preceding chapters is significantly affected by international balance of payments prospects.

It is to be observed, first of all, that the prospect for the satisfactory functioning of the mechanism of international payments has been improved by recent developments. The marked shift in the U.S. balance of payments significantly reflected restoration of the economies of Western Europe and Japan to health and strength, largely because of U.S. policy since 1947. The re-establishment of their gold reserves and dollar balances at more adequate levels enables these trading partners of the United States to continue and expand the liberalization of trade, another long-run objective of U.S. policy. Their willingness to pursue such a course in contributing to correction of the shift in the U.S. payments position is becoming increasingly evident and augurs well for the future. Current U.S. policy is serving to reinforce this tendency, in that correction is being sought by means which emphasize expansion of exports, reduction of discrimination against U.S. imports, and greater sharing of the common burden of military costs and economic assistance rather than by import restrictions or downward revision of the joint goals of Western policy.

It is significant that informed discussion runs in terms of reducing the excess of payments, not of eliminating it. For the United States since World War II has become the world's banker, in much the same sense that this was true of Great Britain prior to 1914. Today, the chief

international currency is the dollar, as once it was the pound sterling. This means that businessmen of other countries require substantial dollar balances in order to conduct their international trading. As their economies expand and the volume of their foreign trade increases, so too must their dollar balances increase, although it should be recognized in passing that the strengthening of non-dollar currencies is beginning to make these currencies more and more acceptable for settlement of international payments. Thus, in the future, dollars will probably finance a growing volume, albeit a smaller percentage, of international trade. This is to say that a certain volume of excess payments to foreigners (though less than the 1958 and 1959 level) will be necessary year after year, simply to enable them to maintain working dollar balances of adequate size. Prior to 1958 it was found that excess payments of between $1 billion and $2 billion a year were necessary, and this continuing "deficit" caused no concern.

The question now to be considered is simply whether rapid domestic expansion over the next few years would alter this prospect and prevent satisfactory correction of the U.S. balance of payments position. It is of course to be expected that such expansion would tend to increase imports and thus to slow the reduction of the excess of payments and prolong the period of adjustment. For a number of reasons, however, this effect should be relatively minor; it should not be expected to be sufficiently strong to inhibit the United States from undertaking expansion, within the limits we have explored, to support any programs that may be found to be important for the national interest. (This conclusion might have to be re-examined if the expanded national programs were to carry a much larger proportion than now of military or economic assistance to foreign countries.)

Most countries of Western Europe have shown strong policy bias toward sustained expansion and have succeeded in insulating their economies from the adverse effects of U.S. recessions. During 1957-58, for example, those economies experienced only a leveling off of production, following which there has been vigorous resumption of expansion. This has already reversed the decline in imports from the United States, which are now increasing at a rate comparable to that which between 1953 and 1957 resulted in an average annual increase of $700 million. This favorable factor for the U.S. balance of payments position will be reinforced, moreover, as European capital exports also continue to increase. To the extent that such capital exports are not "tied" to purchases in the country of origin, non-European countries will be enabled to increase their spending in U.S. as well as European markets.

Although the annual rate of expansion in Western Europe is greater than ours, averaging 5 percent in recent years in contrast to 3-1/2 percent or less for the United States,[1/] it could be expected to increase under the influence of strong expansion here. An increase of the U.S. rate into the range of 5-1/2 to 7 percent (Projections B and C) would not necessarily bring it above the average Western European rate. Not only would U.S. influence and example during such a period of expansion contribute to sustaining such a country as West Germany in its expansion at a rate of 7 percent or more, but the British economy might be stimulated to increase its rate, which, at 3 percent, is close only to that of the United States.

If U.S. expansion is increased to a rate little higher than that simultaneously achieved by the economies of Western Europe, if indeed quite as high, it is questionable whether imports would increase significantly more than exports, or even as much. An important factor here, of course, will be the relative movement of prices. It seems unlikely, however, that prices will come under greater pressure here than in Europe. Because output in Western Europe has been well sustained and expanding at a higher rate than here, under conditions of relatively full employment, the recent resumption of expansion has already resulted in upward pressures on prices. In countries such as West Germany and The Netherlands, moreover, wage increases have been restrained throughout the postwar period by a "discipline" imposed by widespread recognition of balance of payments considerations. With marked improvement in the balance of payments and with gold and dollar reserves well restored, this discipline can hardly be as effective in the future as in the past. There is every reason, accordingly, to expect costs and prices under vigorous expansion to rise as much or more in Europe than in the United States, thus favoring improvement in our balance of payments position.

If a greater price rise should in fact develop, it would be entirely consistent with the experience of the postwar period. The discussion of inflation in the United States has tended to obscure the fact that in most European countries prices have increased more than here, in recent years. Thus, in the United Kingdom the average rise of consumer prices during 1953-59 was 3.1 percent a year, as compared with 1.4 percent in

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1/ "Comparisons of the United States and Soviet Economies," prepared by the Central Intelligence Agency in cooperation with the Departments of State and Defense for the Joint Economic Committee, 86th Congress, 2d Session, Washington, D.C., June 1960, p. 48.

the United States. Even in West Germany, acclaimed for its stern anti-inflation policies, consumer prices increased 1.9 percent a year during this period. The tendency of prices to increase during periods of marked expansion is a matter of proper concern for government policy-makers. The domestic consequences of rising prices have been considered above, and it is these consequences, rather than their effect on the balance of payments, that are likely to be of real concern.1/

It may be noted too that if a tendency toward increased imports and a reduced export surplus should be experienced, the same factors producing this tendency (i.e., higher prices and interest rates) would tend also to make domestic investment more attractive than investment abroad. As an offset to higher imports, accordingly, one could expect at least a marginal reduction in the export of U.S. capital. This expansion might also induce increased imports of foreign capital, reinforcing a reduction in the flow of U.S. capital abroad.

In appraising these implications of domestic expansion for the balance of payments,2/ it is impossible to state categorically that such and such a result must develop under the projected levels of demand. The balance of payments is too complex and too many factors are involved to permit predictions to be made with certainty in this brief analysis. What can be said, in light of this appraisal, is that there is every reason to expect even relatively rapid expansion to be accompanied by and contribute to developments that will limit the effect of such expansion on the balance of payments. Thus, it is likely that measures that would be employed in any event to correct adverse developments will still be found fully adequate for the purpose. Furthermore, it is undoubtedly true that

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1/ A recent article by Laurence P. Dowd effectively summarizes the latest data showing that the relative price and wage trends in the United States and its principal competitor nations (Canada, U.K., Western Europe, and Japan) are favorable to the United States. Dowd emphasizes the need for effective marketing in the U.S. tradition. See "Is the United States being Priced Out of World Markets?" Journal of Marketing, Vol. 25, No. 1, July 1960.

2/ This brief discussion of the balance of payments purposely omits any consideration of (1) the desirability of increasing the dollar price of gold, or alternatively, of eliminating the gold cover required by statute and reaffirming the present price of gold, and (2) the desirability, through the International Monetary Fund or otherwise, of increasing the efficiency with which the world's gold stock is utilized. These questions represent problems that must be solved over the long run without regard to the rate of expansion of the U.S. economy during the 1960's.

whatever adjustments must be made can be more readily carried out in the setting of vigorous expansion than within the cramped circumstances of sluggish international trade. In a very real sense, therefore, purposeful expansion is likely to contribute fully as much to the effectiveness with which the international payment mechanism functions as to the burdens of adjustment with which it must deal.

This is not to suggest that there should be no concern with balance of payments problems. On the contrary, any national decision to undertake urgent new national security programs on a large scale may be expected to reinforce the need and desirability of policies that will improve our balance of payments position, including;

1. Effective marketing of U.S. exports.

2. Continued pressure to induce reduction of import restrictions by our trading partners.

3. Continued pressure for increased sharing by our allies of the burdens of Free World defense and especially of development assistance for the underdeveloped countries

4. Measures to increase the efficiency of international exchange--an interesting example is the recent proposal of Professor Robert Triffin for use of the Development Loan Fund as an international clearing house.

5. More effective use of fiscal and monetary policy for the control of inflation in this country.

We may conclude that with such measures it is completely feasible to consider large security expenditure proposals on their merits, rather than on balance of payments considerations.

Conclusions

This chapter has considered some of the major government policy problems that would arise under the conditions postulated for the projections in Chapter 4. It is not our purpose in this study to recommend particular policies or methods, but we may conclude from the above discussion that in each of the principal problem areas there are available well-understood principles, precedents, and legislative and administrative techniques by which adequate solutions could be developed and enacted to ensure the feasibility of each of the projections within the framework of existing institutions.

Chapter 6

LONG-TERM GROWTH--PROJECTIONS TO 1970

We have examined the feasibility of achieving high levels of national security expenditures, and of total government expenditures, in the minimum practicable time, i.e., by 1964. The question remains: What can be done in the longer term?

Projection further into the future is of course more hazardous. The uncertainties multiply in predicting the response of the economy to given assumed conditions--and to presently unforeseeable conditions. Nevertheless, one can establish some rough approximations, not of what will be done, but of what can be done under certain assumptions.

We shall assume that, once the 1964 level of expenditure in Projection A, B, or C is reached, a requirement remains that the national security programs be sustained. (If expenditures fall back, there is no problem of feasibility though there may be a problem of readjustment.) We shall further assume that "sustaining" a level of expenditure refers to gradual continued growth rather than perpetuation of a static level which decreases in relative importance as the economy of the nation grows and as the economies of potential enemies grow. We shall define "sustaining" as maintaining total GE at a constant ratio to GNP.

The question becomes, then: How rapidly can GNP grow, over the long haul? In order to avoid undue precision in discussing the economy so far into the future, we shall evaluate two alternative "round numbers" for the long-term average rate of growth. The first will be 4-1/2 percent, the rate in Projection A; the second, 5-1/2 percent, a rate almost equal to that in Projection B to 1964 and approaching that which may be the best that the Soviet Union could hope to achieve in the same period.

The Elements of Sustained Growth

The resource limits of these long-term projections will be those we have already considered for the short term, namely, employment, hours of work, and productivity. What rates of change of these factors are sustainable? And we must now add a factor: What investment is necessary to sustain growth? (Growth can be relatively independent of investment for the short term because it is possible for a time to "live on capital,"

that is, to increase rates of utilization of capacity and to decrease rates of maintenance and replacement.)

We shall consider first the requirements for each of these growth resources, for each of the projections. The latter will be five in number: Projections A, B, and C for 1964 (Chapter 4), growing at an average annual rate of 4-1/2 percent up to 1970, and Projections B and C growing from 1964 to 1970 at 5-1/2 percent; the 4-1/2 percent B and C projections will be called "Low," the 5-1/2 percent projections, "High."

Employment

In the projections for 1964, we started off with Bureau of the Census estimates of the population over 14 (which are subject to far less possible error than total population figures--all the people in this bracket in the sixties have already been born). We then estimated possible trends in the rate of participation in the labor force and the rate of employment. In Table XVIII, we start off on Line 1 with the Census estimate for 1970, 150.7 million persons over 14.

For a first approximation of the upper limits of growth, we shall assume the rates of labor utilization and of unemployment and employment which were reached under each projection in 1964. These rates mean that the 1.8 percent rate of growth of the population over 14 during this period is translated into the same rate for total employment. These assumptions must be re-examined when we have considered productivity and work-week trends.

When we look at the paragraphs below, in which this is done, we find that we have maintained higher growth rates for employment than are needed for 4-1/2 percent growth. Accordingly, we revise our assumptions. The possibly tight employment level of 98 percent in Projection C is reduced to 97 percent in the Projection C, Low; in Projections A and B, Low, the labor force participation rates are lowered somewhat from the corresponding 1964 levels--more young people can stay in school, older folk retire, or wives stay home.

These assumptions do not imply a labor force or an economy under stress. The labor force participation rates in the first three projections are below or only slightly above the 1959-60 range. The 59 percent required by Projection C is less than one percentage point above 1960 and three points below the high of 62 in World War II. The employment rates, too, are not really high. Projection A still has the 1959 rate of unemployment, over 5 percent. The next three have 3 percent unemployment, a level frequently mentioned as a maximum desirable for a healthy economy.

Table XVIII

SOURCES OF GROWTH (3): PROJECTIONS TO 1970
SUMMARY OF EMPLOYMENT AND PRODUCTIVITY ASSUMPTIONS

	Projection A			Projection B					Projection C				
					Low		High			Low		High	
	(1) 1964	(2) 1970	(3) Average Annual Change from 1964	(4) 1964	(5) 1970	(6) Average Annual Change from 1964	(7) 1970	(8) Average Annual Change from 1964	(9) 1964	(10) 1970	(11) Average Annual Change from 1964	(12) 1970	(13) Average Annual Change from 1964
Employment													
1. Population over 14 (millions)	136.7	150.7	1.6%	136.7	150.7	1.6%	150.7	1.6%	136.7	150.7	1.6%	150.7	1.6%
2. Labor force participation rate	56.0%	57.7%	—	58.4%	57.9%	—	58.4%	—	59.0%	59.0%	—	60.0%	—
3. Labor force (millions)	76.7	87.0	1.7%	79.3	87.2	1.6%	88.0	1.8%	80.1	88.9	1.8%	90.0	1.9%
4. Employment rate	95.0%	96.5%	—	97.0%	97.0%	—	97.0%	—	98.0%	97.0%	—	98.0%	—
5. Employment (millions)	73.6	84.0	1.8%	76.9	84.6	1.6%	85.4	1.8%	78.5	86.3	1.6%	87.3	1.8%
Productivity													
6. Output per man-hour	$3.83	$4.48	3.3%	$3.96	$4.80	3.0%	$4.90	3.9%	$3.90	$4.80	3.0%	$4.90	3.9%
7. Average weekly hours	39.0	38.2	-0.6%	40.2	39.8	-0.6%	39.5	-0.3%	41.6	40.1	-0.6%	40.0	-0.3%
8. Output per employee (annual)	$7,804	$9,240	2.7%	$8,183	$9,070	2.9%	$10,000	3.6%	$8,410	$9,980	2.9%	$10,400	3.6%
Gross National Product													
9. Real gross national product (billions of 1960 dollars)	$556	$770	4.8%	$627	$817	4.6%	$853	5.0%	$650	$860	4.9%	$910	5.8%

Source: 1964 data from Table XII. See text for assumptions leading to the 1970 data.

And even in Projection C, High, with growth at 5-1/2 percent and almost a third of GNP devoted to government--22 percent to national security--we still have 2 percent unemployment, more than double the World War II minimum.

Productivity and the Average Work-Week

Line 6 shows the annual rate of increase in productivity per man-hour assumed in each projection. It will be recalled that for 1964, approximately the postwar (1947-55) rate of 3.5 percent was assumed throughout. This moderate assumption is continued for the 4-1/2 percent GNP projections to 1970. If the postwar (1947-59) downtrend in weekly hours of work, -0.6 percent per annum, persists, then output per man will continue to grow at the 1947-55 rate of 2.9 percent. For the more ambitious 5-1/2 percent projections, it has been assumed that hourly productivity will grow at one-ninth more rapid a rate, i.e., at 3.9 instead of 3.5 percent. We have also assumed that the average work-week will decline only half as rapidly, i.e., 0.3 percent a year. This would mean an implicit national decision that the state of urgency was such as to require that we forego during the sixties the taking of some portion of the fruits of increased productivity in the form of increased leisure.

Should productivity (real GNP per man-hour) fail to rise more rapidly in the high- than in the low-growth models, then it would be necessary to forego even the 0.3 percent annual reduction in weekly hours. On the other hand, it may be that productivity can increase more rapidly than is assumed in Line 6. This is quite possible under the conditions of high demand, full employment, and steady investment inherent in the projections,[1/] as well as in light of the continued acceleration of research and development, both public and private, which seems likely in this decade.

The possibility that productivity may increase more rapidly, particularly under Projection C, is enhanced by an often-overlooked phenomenon. Defense expenditures often--perhaps invariably when they are at a high level--contribute to productivity in the private sector. The technological fruits of the armed services research and development very often find their way, after a short time-lag, into civilian industry. One need only

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1/ See discussion of investment in producers' equipment in Appendix C.

mention transistors, electronic computers, jet transports, television components, automated machinery, to pick the more spectacular examples off the top of the pile. It is really unreasonable to envision a protracted step-up of security expenditures, in a time when defense is dominated by the new high technology, in which the military will not contribute increasingly to acceleration of technological development and in which civilian productivity will not share in the benefits.

To the extent that productivity does accelerate, several options become available. Weekly hours could be shortened, marginal members of the labor force could drop out, the economy could grow more rapidly than postulated, or some combination of these factors might eventuate. In the "tight" Projection C, High, or in the other projections under some monetary and other economic policies, unemployment might stop short of declining to the low levels projected.

If, for example, hourly productivity were to grow at 4.5 percent, just 1 percent above the 1947-55 rate and 0.6 percent above the rate in our High projections, GNP could grow as rapidly as 6.5 percent, reaching $964 billion in 1970. Or the labor force participation rate could approximate the estimated 1960 level of 58.1 percent; unemployment, the 3 percent of Projections B and C, Low; and hours of work, the secular downtrend of -0.6 percent.

The relative contributions of the several factors of projected growth, 1964-70, are shown in Figure 14.

Investment

In making the 1964 projections, we took account of the tendency for the percentage of GNP taken by private investment (I) to decline as the percentage for government (GE) increases. We did not reduce I/GNP as rapidly as occurred in World War II and Korea, however, since we did not contemplate a comparable degree of deferment of investment. But there would be some deferment under Projection C, and under both B and C there would be higher than usual rates of utilization of plant capacity.

For the long haul, of course, deferment of investment and increasing utilization of existing capital stock are not feasible means of providing for growth. There must be continuing investment adequate to provide for growth in the number of workers, for increased productivity, and for any increases in the capital-output ratio (or of capital per worker) required by technological changes.

LEGEND FOR FIGURE 14

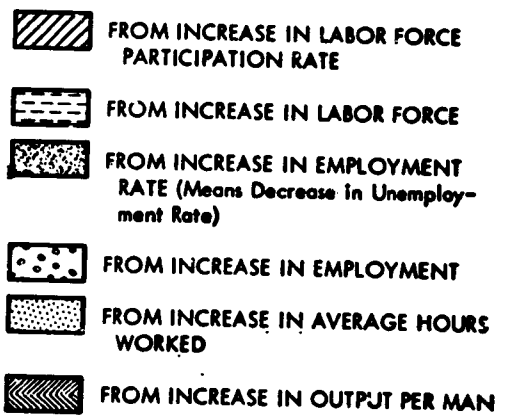
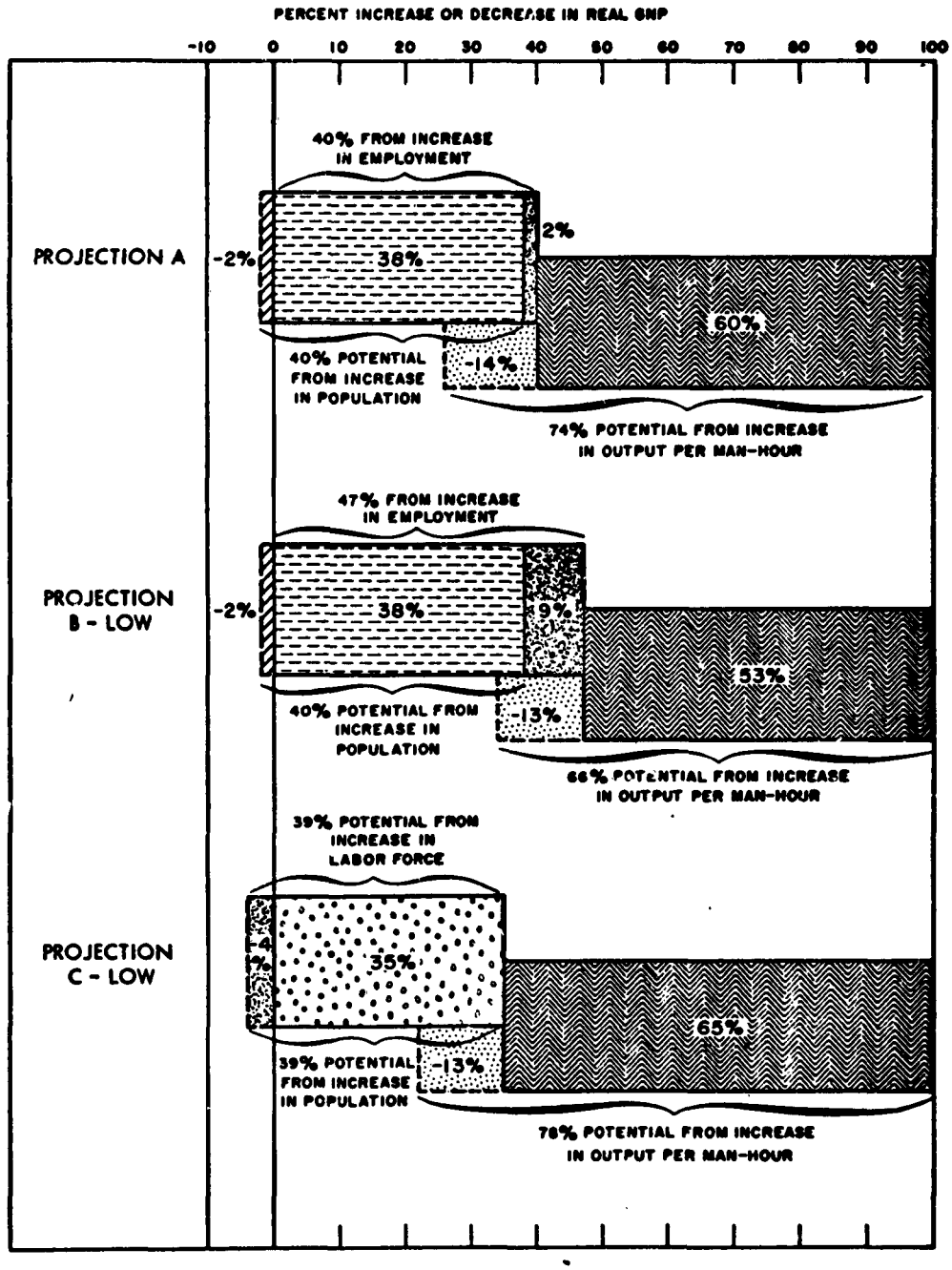


FIGURE 14

SOURCES OF GROSS NATIONAL PRODUCT GROWTH
1964 - 1970



SOURCE: Computed from Table XVIII, by method given in Appendix A.

Theoretically, knowledge of the marginal "capital-output ratio" would permit the establishment of a direct relationship between long-term rates of investment and growth.[1/] With adequate knowledge of government investment, a factor could be introduced to make private investment a function of the rate of growth of GNP and GE/GNP, i.e.,

$$I = f\left(\frac{d\ GNP}{dt}\right) - I\ public$$

In practice, it is difficult, perhaps impossible, to estimate either a useful over-all marginal capital-output ratio or government investment and the changes in I/GNP with changes in GE/GNP. Investment as defined in the national income statistics includes a number of series of divergent trends and relationships to GNP. It includes an item of consumer investment--housing--although consumer durables remain under consumption.

We have chosen, therefore, to estimate separately the major components of investment. This permits, for example, allowing producers' equipment to rise sharply with the GNP growth rate, but lets housing decline in percentage terms, as GE/GNP rises. Agricultural investment, too, takes a smaller percentage as GE/GNP rises, but also as GPE/capita rises and perhaps also as a function of time alone. The estimates, by component, are made and explained in Appendix C.

The results are interesting. Despite the fact that our projections involve growth rates of 4-1/2 and 5-1/2 percent, and GE/GNP ratios of from 20 to 32 percent, the variation in investment requirements (I/GNP) is surprisingly small. The range is from 17 to 19 percent. One percent more of GNP, in round figures, is allocated to investment to support a 5.5 percent growth rate of GNP, as against a 4.5 percent rate; but 1 percent less is required for I, when the GE share goes from 24 to 32 percent of GNP. These increases represent larger absolute increments, since they are percentages of successively larger GNP bases.

1/ See Eisner, op. cit., and Evsey D. Domar, Essays in the Theory of Economic Growth, New York, Oxford University Press, 1957.

The 1970 Projections

Table XIX and Figure 15 present projections for 1970 based on the following assumptions:

1. Growth of GE from 1964 is at the 4-1/2 and 5-1/2 percent average annual rates, for which the required employment, hours, and productivity trends were discussed above.

2. GNP is assumed to grow at the same rate as GE, so that the GE/GNP ratio in each case remains constant and GE does not constitute an increasing relative burden.

3. State and local government expenditures are assumed to continue to rise at the 5.5 percent rate which has obtained since Korea and was assumed for the 1964 projections.

4. Federal expenditures for goods and services rise only enough to be consistent with assumption 1 for total GE, in the light of assumption 3 for state and local GE. This rate varies from 3.5 to 5.5 percent.

5. Federal nonsecurity expenditures rise at 3.5 percent per annum; this is 1.7 percent per capita. National security expenditures take the balance--rising at from 3.5 to 5.6 percent a year.

6. Investment (I) represents the shares of GNP developed in the preceding section.

7. Consumption is a residual (C = GNP - GE - I).

Under these assumptions, GNP ranges from $776 billion in 1959 dollars under a continuation of the 1964 Projection A, to $910 billion under Projection C, with a 5-1/2 percent growth rate. The government share varies even more widely, from $155 billion to $291 billion.

Under the highest of the projections, national security expenditures would exceed $200 billion in 1970, more than four times the current level. (Figure 16). And this could be done while the "normal" growth of other federal or state and local expenditures continues and the private economy grows more rapidly than in the past. Growth of GNP at 4-1/2 to 5-1/2 percent from Projection B in 1964 would provide $106 to $115 billion for security purposes. And the modest but continuous growth of Projection A would provide $65 billion, or about $20 billion more than today's level.

Table XIX

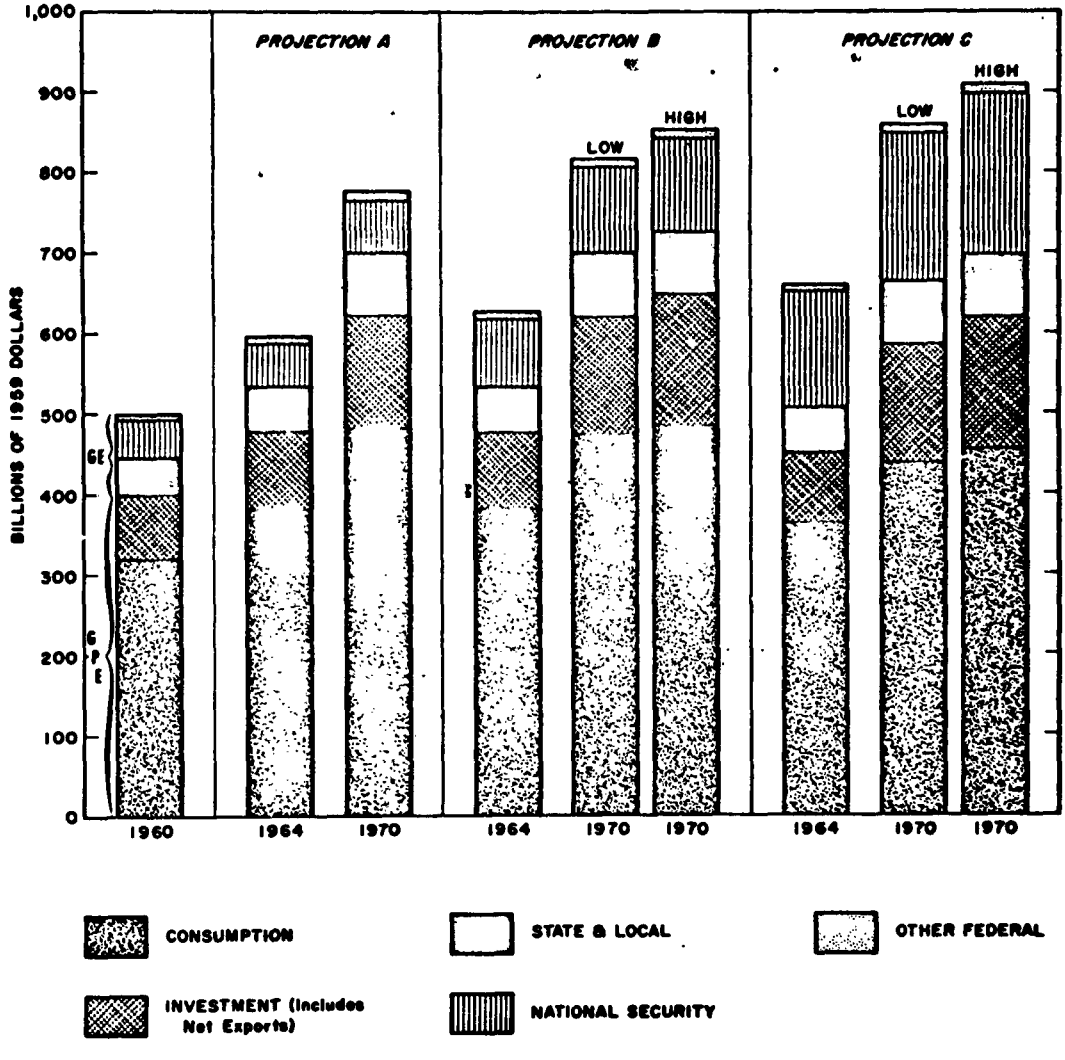
NATIONAL SECURITY EXPENDITURES AND GNP (3): POTENTIAL BY 1970
(Billions of Dollars)

	1964 (Amount)	1970 (Amount)	Percent of GNP	Average Annual Growth from 1964	1970 (Amount)	Percent of GNP	Average Annual Growth from 1964
	(1)	(2)	(3)	(4)			
Projection A							
Gross national product	$596	$770	100%	4.9%			
Government expenditures	119	154	20	4.5			
Federal	63	76	10	3.5			
National security	53	65	8-1/2	3.5			
Other	9	11	1-1/2	3.5			
State and local	57	79	10	5.5			
Gross private expenditures	477	621	80	4.5			
Consumption	382	481	62	3.9			
Investment	96	140	18	6.7			
	Low				High		
	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Projection B							
Gross national product	$627	$817	100%	4.5%	$853	100%	5.0%
Government expenditures	150	196	24	4.5	208	24	5.5
Federal	93	117	14	3.9	126	15	5.5
National security	84	106	13	4.0	115	14	5.5
Other	9	11	1	3.5	11	1	3.5
State and local	57	79	10	5.5	79	10	5.5
Gross private expenditures	477	621	76	4.5	646	76	5.5
Consumption	382	474	58	3.7	486	57	4.2
Investment	96	147	18	7.5	162	19	9.3
	Low				High		
	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Projection C							
Gross national product	$660	$860	100%	4.5%	$910	100%	5.5%
Government expenditures	210	274	32	4.5	291	32	5.5
Federal	153	198	23	4.1	212	23	5.5
National security	145	184	22	4.1	201	22	5.6
Other	8	11	1	3.5	11	1	3.5
State and local	57	79	10	5.5	79	10	5.5
Gross private expenditures	450	586	68	4.5	619	68	5.5
Consumption	364	439	51	3.2	455	50	3.8
Investment	86	147	17	9.2	164	18	11.4

Source: 1964 figures from Table X; 1970 estimated as discussed in text.

FIGURE 15

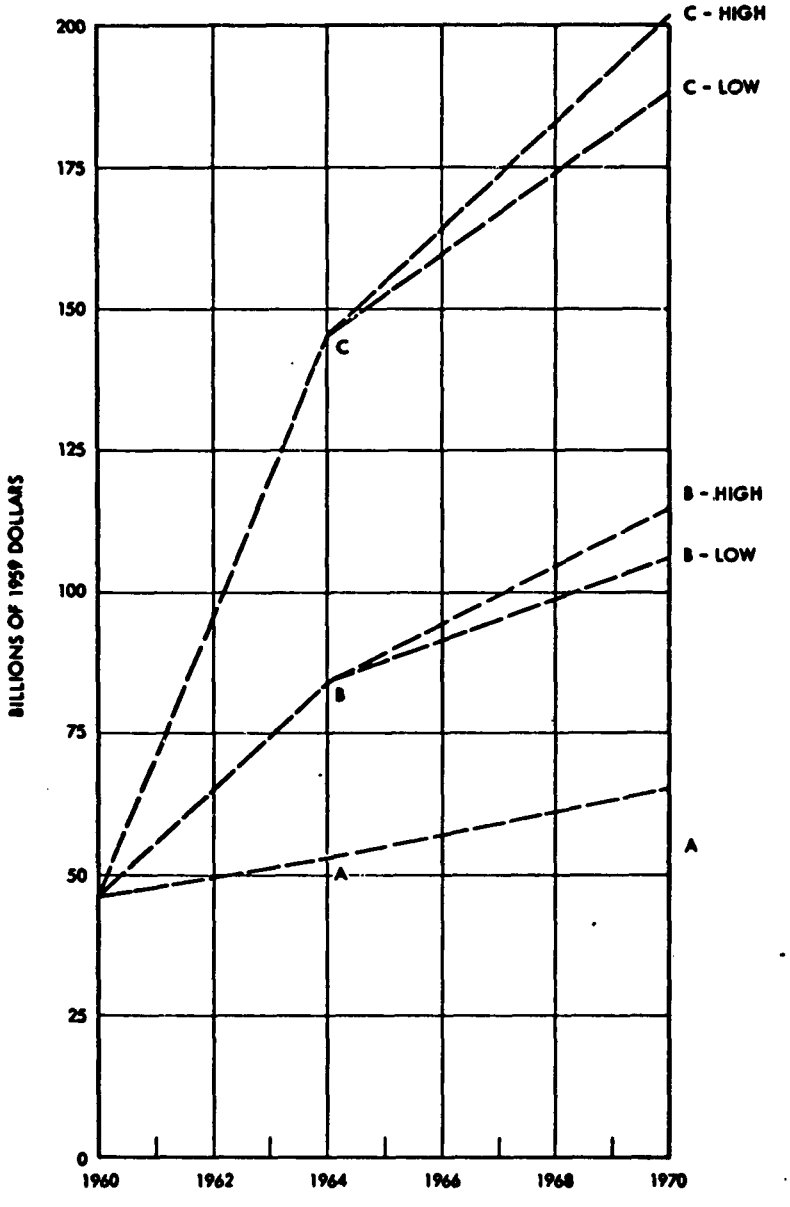
GROSS NATIONAL PRODUCT AND COMPONENTS
ESTIMATE FOR 1960 AND PROJECTIONS TO 1964 AND 1970



SOURCES: Tables X and XIX

FIGURE 16

NATIONAL SECURITY EXPENDITURES
ESTIMATE FOR 1960 AND PROJECTIONS TO 1964 AND 1970



SOURCES: Tables X and XIX.

While each of the projections is feasible if it proves necessary, they are not all achievable with equal ease. There may, in fact, be real strains involved in the C projections, particularly C, Low.

Consumption

The key is to be found in the trends of consumption. The projections provide for average increases in consumption of 3.1 to 4.2 percent a year, or from 1.5 to 2.6 percent per capita. These are not insignificant rates of progress for the consumer; they are, in fact, more than he has been accustomed to for any protracted period in this century. Nevertheless, Projection C, Low, reflects the sharp shift of direction for the economy which is implied in our assumptions. (It will be recalled from the preceding section that Projection C, High, was the only one to show possible strains on the sources of growth, in that it required a continued 98 percent employment rate.)

The cause of the lag of consumption behind the other sectors is, of course, the need for raising the level of investment to sustain more rapid growth. The high growth rates shown for investment reflect the need for catching up after the rapid buildup of the 1961-64 period, during which rates of plant utilization were increased and some capital "consumed." Once the required levels of annual investment are reached, in or before 1970, annual investment need grow only as fast as GNP, and consumption can also grow at that rate.

But meanwhile, holding down the growth of consumption below that of the rest of the economy may be expected to generate demand pressures. Under Projection C, Low, these pressures might require institutional changes for their containment. Such changes would be in the category of direct controls and/or of revisions in the tax structure. Otherwise the pressures would work themselves out in inflation, presumably at a higher rate than that of recent years.[1/]

1/ Even with direct or indirect controls one can readily envision a problem of containing the pressure for rapid wage increases in a situation in which output was rising rapidly, because of high employment, interruption of the downtrend in hours of work, and high and steady increases in productivity.

We have already posited the need for controls during the buildup period of Projection C. But controls are by their very nature designed for the solution of short-run problems. Their prolongation entails and induces both economic and administrative difficulties too familiar to require discussion here.

We may jump for a moment to the third choice, inflation in lieu of "containment." We have noted earlier that some price increases are useful and efficient, as a means of shifting resources to government (and investment) programs. We noted also that such increases are unlikely to be offset by equal decreases, with or without price controls, so that the net result is some inflation. But, clearly, we would not wish to have long-drawn-out inflation at a much higher rate than that necessary for the selective shifting of resources by means of prices.

Which brings us back to the second choice, tax revision. We considered in Chapter 5 the levels of taxation necessary for the full pay-as-you-go financing of the expanded government programs, as well as one example of a plausible combination of tax- and deficit-financing. Under either (or an intermediate) assumption, the average rate of taxes would need to be maintained as long as a given proportion of GE to GNP were maintained. It was pointed out that the rate structure itself might decline somewhat because of the elasticity of the income tax as real GNP rises and as inflation takes place. But if we treat the total-tax-yield-to-GNP ratio as an index of "average rates," or "impact," then under the postulated conditions the tax level must be maintained.

The present tax structure was not designed, however, to contain the kind of inflationary pressures we are postulating, and one may be permitted to question whether the kind of tax structure likely to be built up rapidly to finance a precipitiously expanded expenditure program could be expected to do any better. One would need to consider a tax program designed to encourage investment and hold down consumption.

Directions for the encouragement of investment have been pointed by the Tax Amortization program of World War II and Korea (in which Certificates of Necessity permitted the five-year write-off, or "rapid amortization" of all or part of investments in plant and equipment adjudged to be in the interests of the defense effort) and by the liberalized depreciation provisions of the Tax Law of 1954. Without participating here in the debate on the merits of the particular provisions, or on the validity of the claims of "defense" need for many of the Certificates of Necessity actually issued, we can conclude that the tax laws can influence to some degree the propensity to invest. Special credit facilities may also help.

More important, and more obvious: Taxes can influence consumption. During a period in which the supply of goods for consumption cannot grow apace with the total national product, tax policy can be a flexible and effective tool for constraining consumption demand.

During past emergencies there have been brought to the fore various proposals, such as the "expenditures tax," for modification of the income tax in ways to discourage consumption and encourage saving (as distinguished from discouraging both, simply by raising the rates). Some of these proposals offer great promise. The history of the income tax, however, has been one of changes to encourage consumption in special categories, but never to discourage consumption except as over-all income after taxes is reduced.

Most likely to be effective in restraining consumption are taxes on consumption goods and services--excise taxes and sales taxes, taxes which are also highly enactable and collectible. The expenditures tax might also serve the purpose.1/

Despite the feeling on the part of many that excise and sales taxes are inequitable and therefore undesirable, such taxes could be a relatively precise instrument for achieving the effects required in this instance--and by virtue of success in this purpose, they might well prove to be more equitable than available alternatives.

As with all other forms of controls, direct or indirect, these taxes would have to be used with care to ensure that they not inhibit consumption too strongly, particularly at the stage when the buildup of investment abates and more rapid growth of consumption becomes feasible. Otherwise, cuts in consumption would be translated into cuts in total output

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1/ Indirect taxes on consumption have limitations as tools to inhibit consumption. Rates that may be tolerable for the populace as a whole may have negligible effect on the rich. Income taxes, on the other hand, while they can have progressive rate schedules, do not limit the consumption of those who have accumulated liquid savings and choose to use them. An expenditures tax is direct, like the income tax, and can be progressive. It affects all expenditures, whether out of income or capital. On the other hand, it may be more suitable to wartime than to peacetime conditions, since it may constitute a more direct request to the people to limit their consumption than is consistent with the peacetime use of an increasing supply of consumption goods and services as an incentive to increase output.

and growth rather than contributions to investment or government programs. But, properly used, taxes on goods and services, or on expenditures, could effect the adjustments necessary to carry out these constrained-consumption (not low-consumption) projections. Other modalities may commend themselves; our concern here is to establish that there are some means by which the given programs are feasible.

Effective Multipliers for the Long Term

Projection A to 1970 is simply an extension of the trends established in Projection A to 1964. It will be recalled from Chapter 4 that the demand from the increased GE in Projection A to 1964 was not sufficient to be likely to induce a GNP growth rate of 4.5 percent. It was necessary to postulate inducements to an autonomous increase in I as well, in order to have a reasonable ratio of the increase in GNP to the increase in (GE + I), and it seemed likely that tax changes to encourage consumption might also be required. It is now assumed that the same policies are continued to 1970, in order to sustain the same pattern. From Table XIX we see that, in Projection A, GNP increases by $180 billion. GE increases by $36 billion, giving a ΔGNP/ΔGE ratio of 5.0; but GE + I increases by $81 billion, so that ΔGNP/Δ(GE + I) is only 2.2, or less than the 3.0 for the 1960-64 change.

If we take Projection A as a base, as we did for the 1964 Projections B and C, we find the following increases for B and C over A, 1946-70 (in billions of 1959 dollars):

	Projection B		Projection C	
	Low	High	Low	High
GNP	$77	$41	$134	$ 84
GE	$50	$41	$136	$119
GNP/GE	1.5	1.0	1.0	0.7

Clearly, there will be problems in restricting private demand sufficiently to keep the factors this low, particularly in Projection C, Low. In this case, we have already noted that consumption would have to be carefully controlled, even though it would be increasing more rapidly than historically--or GNP would have to rise more rapidly than 4.5 percent. The limiting factor might prove to be the tight labor market of Projection C, High, and the postulated GE levels would be realized in an economy growing at about 5.0 percent. To some extent the same may indeed be true for Projection B, Low.

The indirect controls implied by these expansion ratios may not be as onerous as they sound, however. They reflect a cutback from the stimulation given to the private sector by fiscal, monetary, and other indirect control policies under Projection A. The ratios are much higher if we calculate them as increases over 1947-59 trends (in billions of 1959 dollars), thus:

	1970 at 3.5% Growth Rate from 1964			Increases above Trend in 1970 Projections				
				Proj.	Projection B		Projection C	
	A	B	C	A	Low	High	Low	High
GNP	$732	$771	$811	$44	$46	$82	$49	$99
GE	146	184	258	9	12	21	16	33
GE + I	263	301	364	32	42	66	56	91
GNP/GE				4.9	3.8	3.9	3.1	3.0
GNP/(GE + I)				1.4	1.1	1.2	0.9	1.1

Now it can be seen that the implied effective multipliers are not so low when measured against the standard of the current pattern of growth and the policies which are part of the current environment, instead of against those postulated for Projection A. The impact of added GE is allowed considerable leeway to work itself out. (Again, Projection C, Low, is revealed as the most restrictive.) Even when we include the large increases in I, as it catches up from the restrictions on its 1964 level, the GNP increase ratios are larger than those against GE alone, when only increases above Projection A are considered.

This analysis, then, reinforces the conclusion that the projections in no case depend on an inadequate demand base and, more important, that they do not reflect unmanageable demand pressures, except possibly for some difficulties in C, Low, and perhaps even in B, Low.

Conclusion

The argument of these projections to 1970 demonstrates that the economic resources of the United States make feasible the support of very large national security programs in the long- as well as the short-run, in the coming decade as well as in a four-year buildup decided upon in the near future.

We have examined both economic policy and resource requirements, to establish feasibility of our projections within our institutional framework as well as in the light of physical and technological resources.

Further, it has been demonstrated that such programs can be supported from the increments of growth--from a larger pie rather than by redivision of the existing one. Consumption--total and per capita--can grow more rapidly than in the past, even while necessary programs, up to very high levels, are undertaken. Leisure--involuntary and perhaps voluntary--would be impinged upon, but not the standard of consumption and its continuing enhancement.

Only Projections C (High and Low) have seemed possibly to border on the lines of strain in the economy. Projection C, Low, requires the containment of consumption--not to low growth in relation to historical rates, but to a rate well below that of other sectors of the economy. The C, High, projection, on the other hand, requires keeping unemployment to 2 percent--not the 1 percent achieved for a short period during World War II, but nevertheless a tight labor market that could exacerbate the problems of controlling inflation, although it would also provide impetus for acceleration of productivity increases. But these strains would appear to be well within the bounds of the supportable and controllable. Alternatives for ameliorating them were suggested under the Elements of Sustained Growth. The simple alternative, of course, is less rapid growth of national security expenditures, with perhaps a slight assist from a slower growth rate for other federal government expenditures. Many alternative programs can be suggested; we have simply sought to test the feasibility of certain high objectives.

We have said nothing about the need for such large undertakings. Nor have we discussed the problems of mobilizing the national will to undertake them, if the need be proved. We have been concerned with economic considerations only, with what is economically feasible, so that political argument--or strategic argument--or argument about national values--can take place on its own ground, without confusion as to economic realism.

Appendix A

PROCEDURE FOR COMPUTING RELATIVE CONTRIBUTIONS OF SOURCES OF GROWTH IN FIGURES 5, 13, AND 14

APPENDIX A

PROCEDURE FOR COMPUTING RELATIVE CONTRIBUTIONS OF SOURCES OF GROWTH IN FIGURES 5, 13, AND 14

Let

C_i = contribution to growth, in billions of 1959 dollars.

i = subscripts 1 to 9, corresponding to lines 1 to 9 in Tables VIII, XII and XVIII.

C'_i = relative contribution, in percentage. Thus,

$C'_i = 100\ C_i/_9$; $C'_9 = 100$

V_i = value of variable on each line

V_{io} = value of V_i in base year of period measured

V_{ij} = value of V_i in final year, j, of period measured

$V_{id} = V_{ij} - V_{io}$ = change in V_i during period

Then

$$C_1 = V_{1d} \cdot V_{2o} \cdot V_{4o} \cdot \sqrt{V_{8o} \cdot V_{8j}} = V_{1d} \cdot V_{2o} \cdot a$$

$$[a = \sqrt{V_{8o} \cdot V_{8j}}]$$

$$C_2 = C_3 - C_1$$

$$C_3 = V_{3d} \cdot V_{4o} \sqrt{V_{8o} \cdot V_{8j}} = V_{3d} \cdot a$$

$$C_4 = C_5 - C_3$$

$$C_5 = V_{5d} \sqrt{V_{8o} \cdot V_{8j}} = V_{5d} \cdot a/V_{4o}$$

$$C_6 = V_{6d} \sqrt{V_{5o} \cdot V_{5j}} \cdot 52 \sqrt{V_{7o} \cdot V_{7j}} = V_{6d} \sqrt{V_{7o} \cdot V_{7j}} \cdot 52b$$

$$[b = \sqrt{V_{5o} \cdot V_{5j}}]$$

$$C_7 = V_{7d} \sqrt{V_{6o} \cdot V_{6j}} \cdot 52b$$

$$C_8 = C_6 + C_7 = V_{8d} \cdot b = V_{8d} \sqrt{V_{5o} \cdot V_{5j}}$$

$$C_9 = C_5 + C_8 = V_{9d}$$

Thus, the increase in real GNP (C_9) is the sum of: (1) the increase in employment (V_{5d}) times the average (geometric mean) of the base period

and current rates of output per man ($\sqrt{V_{8o} \cdot V_{8j}}$); and (2) the increase in output per man (V_{8d}) times the average of base period and current employment ($\sqrt{V_{5o} \cdot V_{5j}}$). In deriving these figures, C_1, for example, is computed by taking the increase in population, times the base period rates of labor force participation and employment, times the average of base period and current output.

This approach gives an approximate solution to a paradox: if one uses base periods ("*o*") weights throughout, *i.e.*, everywhere that a geometric mean appears above, he will not account for all the increase in GNP (C_9); if he uses current ("*j*") weights, he will account for *more* than the total increase in GNP; if C_5 or C_8 is computed first, with either "*o*" or "*j*" weights, and the other component of C is computed as a residual, the allocation, or ascription of causation, is arbitrary and depends, in effect on the point at which one chooses to start the computations.

The same results can be roughly approximated simply by taking the percentage increases on each line, 1 through 8, (or the average annual percentage increases carried to one more place than shown in our tables) and dividing by the sum of the increases on lines 5 and 8 (which will be less than the percentage increase for line 9).

Appendix B

GNP PROJECTIONS FROM OTHER SOURCES

Appendix B

GNP PROJECTIONS FROM OTHER SOURCES

The reader may be interested in comparing the projections offered in this study with others made by various economists and organizations during recent years. For this reason, projections of gross national product from 16 sources are listed in Table B-I. The raw data of these projections were stated in the current dollars of the date each projection was prepared, which varied from June 1952 (the Paley report) to the spring of 1960 (National Planning Association, National Industrial Conference Board), or in dollars equivalent in purchasing power to those of some prior year. A first task in achieving comparability and application to the present problem was to transform these varied projections into common units. This was done by converting them all to dollars of purchasing power equal to that of the 1959 dollar.

Table B-I, therefore, presents the results of these conversions in projections in each case for one or several of the years from 1960 to 1975. In a number of cases several projections are made on the basis of various assumptions with regard to the level of national security or defense expenditures. In one instance, that of the Rockefeller Brothers Fund report, various alternative rates of growth (3, 4, and 5 percent) are projected but no commitment is made as to which of these rates seems most likely.

In Figure B-1, the projections have been plotted to illustrate their spread.

Table B-II transforms the original data to a form more applicable to our analysis but, it should be understood, involves simplifying assumptions which were not generally suggested by the original authors and which we are not prepared to assert would always prove acceptable to them. What we have done is to interpolate or extrapolate the years 1960, 1964, and 1970 whenever these years were not explicitly projected. The extent of this transformation may be gathered by noting, in Table B-I, that of the 16 different sets of projections only one pertains directly to both the years 1964 and 1970, and none projects gross national product in all three years.

Table B-II has been constructed by interpolating or extrapolating on the basis of constant rates of growth from the gross national product at the time of the projection to the projected year closest to 1964, and

Table B-I

EXPLICIT PROJECTIONS OF GROSS NATIONAL PRODUCT
(Billions of 1959 Dollars)

Date of Source	Source	Projection to:	Amount of GNP
1. April 1959	Fortune	1960	$ 500.
		1965	615.
		1970	750.
2. Jan. 1958	General Electric		
	A. 1962 Nat. Sec. Expend. of $55 billion	1962	531.4
	B. 1962 Nat. Sec. Expend. of $65 billion	1962	530.7
3. March 1959	A. S. Goldberger (The Nation)		
	A. 1962 Defense Expend. of $45 billion	1962	507.2
	B. 1962 Defense Expend. of zero	1962	493.0
4. April 1959	Harvard Business Review		
	A. 1963 Defense Expend. of $48 billion	1963	535.
	B. 1963 Defense Expend. of $58 billion	1963	575.
5. Oct. 1964	Joint Committee on the Economic Report	1965	606.7
6. Jan. 1960	Joint Economic Committee, Study Paper No. 20		
	A. High potential growth @ 5.2% per an.	1975	1,079.
	B. Medium potential growth @ 4.7% per an.	1975	1,000.
	C. Low potential growth @ 4.2% per an.	1975	926.
7. Nov. 1958	L. H. Keyserling	1964	641.2
8. 1958	McGraw-Hill	1965	601.7
		1975	864.8
9. 1960	National Industrial Conference Board	1970	796.
10. 1960	National Planning Association		
	A. Judgment model	1963	580.1
		1964	604.5
		1965	633.0
		1970	791.3
	B. High Growth - High Government Model	1965	644.3
		1970	817.9
11. 1962	Paley Report	1975	720.3
12. Nov. 1956	Railway Progress Institute	1960	494.8
		1965	593.5
13. 1958	Rockefeller Bros. Fund, Inc.		
	A. Projection of 3% annual growth, 1957-67	1967	603.8
	B. Projection of 4% annual growth, 1957-67	1967	664.9
	C. Projection of 5% annual growth, 1957-67	1967	732.3
14. Sept. 1957	Stanford Research Institute	1960	512.9
		1965	613.9
		1970	738.5
		1975	888.0
15. June 1957	U.S. Department of Commerce	1960	449.1
		1965	579.6
16. 1960	U.S. Department of Labor	1960	514.
		1965	608.
		1970	744.

Sources for Table B-I

1. Gilbert Burck and Todd May, "The Good Uses of $750 Billion," Fortune, April 1959, pp. 104-107, 226 ff. The gross national product is projected for 1965 and 1970 in 1959 dollars, along with an estimate of 1960 GNP:

	Billions of 1958 Dollars
1960 - Estimated GNP	$500
1965 - Projected GNP	615
1970 - Projected GNP	750

2. Dale J. Hekhuis, The Economics of US-USSR National Security Expenditures, Technical Military Planning Operating Report, General Electric Company, Santa Barbara, California, January 1958, p. 9. Hekhuis presents a preliminary estimate of actual 1957 GNP and two alternative 1962 projections, all in 1957 dollars. Both 1962 projections assume full employment conditions. Program A assumes national security expenditures of $55 billion; Program B assumes $65 billion. The estimates for 1957 and alternative explicit 1962 projections are, in 1957 dollars:

	Billions of 1957 Dollars
1957 - Actual GNP (preliminary estimate)	$434
Business Investment	67
Government	87
Consumption	280
1962 - Projected GNP (Program A)	513
Business Investment	79
Government	112
Consumption	322
1962 - Projected GNP (Program B)	521
Business Investment	82
Government	122
Consumption	317

Sources for Table B-I (cont.)

3. A. S. Goldberger, "Conversion: The Magnitude of the Task," The Nation, March 28, 1959, pp. 271-275. The author presents a preliminary estimate of 1958 GNP, an explicit projection of 1959 GNP, and two alternative explicit projections of GNP in 1962. Program A in 1962 assumes the continuation of present trends in defense spending; Program B assumes the elimination of all defense spending. The preliminary estimate of actual 1958 GNP, the explicit projection for 1959, and two projections for 1962, all in 1958 dollars, are:

	Billions of 1958 Dollars
1958 - Actual GNP (preliminary estimate)	$437
1959 - Projected GNP	455
Business Investment	65
Government	95
Consumption	295
1962 - Projected GNP (Program A)	500
Business Investment	74
Government	101
Consumption	325
1962 - Projected GNP (Program B)	486
Business Investment	90
Government	56
Consumption	340

4. Manuel L. Helzner, "Import of More Defense Dollars," Harvard Business Review, March-April 1960, p. 27 ff. Projects (a) GNP to 1963 assuming continuation of current defense programs with slow economic growth and (b) a $10 billion increase in defense programs with full employment growth rates.

	Billions of 1959 Dollars
1959 - Actual GNP	$478.8
Business Investment	69.6
Government	97.9
Consumption	311.4

Sources for Table B-I (cont.)

	Billions of 1959 Dollars
1963 - Projected GNP (slow growth)	$535
Business Investment	80
Government	105
Consumption	350
1963 - Projected GNP (fast growth)	575
Business Investment	88
Government	117
Consumption	370

5. Potential Economic Growth of the United States During the Next Decade, Materials Prepared for the Joint Committee on the Economic Report by the Committee Staff, 83rd Congress, 2d Session, Washington, 1954, p. 20. These include 1953 actual GNP and components, and an explicit projection of 1965 GNP, both in 1953 dollars:

	Billions of 1953 Dollars
1953 - Actual GNP	$364.9
Business Investment	49.5
Government	85.2
Consumption	230.1
1965 - Projected GNP	535
Business Investment	81
Government	97
Consumption	357

6. James W. Knowles, The Potential Economic Growth in the United States, Study Paper No. 20, Joint Economic Committee, "Study of Employment, Growth, and Price Levels," January 30, 1960, p. 40. Projects alternative potential annual growth rates for GNP for the period 1959-75 as follows:

Alternative annual growth rate A (High) - 5.2%
Alternative annual growth rate B (Medium) - 4.7%
Alternative annual growth rate C (Low) - 4.2%

7. L. H. Keyserling, "Next Step, a $600 Billion Dollar Economy?" New York Times Magazine, November 23, 1958, p. 13 ff. Keyserling advocates the adoption of policies to foster a 5 percent growth rate in GNP. He presents actual 1957 GNP and projects 1964 GNP of "over $600 billion." His figure of 1957 GNP of $440 billion (in 1957 dollars), projected at a 5 percent per annum growth rate, would result in a 1964 GNP of $619.1 billion.

8. The American Economy: Prospects for Growth to 1965 and 1975. Prepared by the McGraw-Hill Department of Economics, McGraw-Hill Publishing Co., New York, 1958, pp. 5-7. This booklet presents a preliminary estimate of actual 1957 GNP with components, and explicit projections for 1965 and 1975, all in 1957 dollars:

	Billions of 1957 Dollars
1957 - Actual GNP (preliminary estimate)	$434.0
Business Investment	53.4
Government	86.4
Consumption	294.6
1965 - Projected GNP	581
1975 - Projected GNP	835
Business Investment	100
Government	150
Consumption	585

9. National Industrial Conference Board, "Economic Growth in the 1960's," from 44th Annual Meeting chart survey, 1960. Projects economic growth potential for GNP to 1970 at $796 billion (in 1959 prices).

10. National Economic Projections, National Planning Association, (subscriber service), Washington, 1960, pp. 58 and 59. This major source of GNP projections presents actual GNP for 1959 and a series of alternative models for future years. The "Judgment Model" for 1963-1966 and 1970, and 1971, in 1959 dollars, is as follows:

Sources for Table B-I (cont.)

	Billions of 1959 Dollars	
	Judgment Model	High Govt. Model
1959 - Actual GNP	$479.5	$
Business Investment	71.1	
Government	97.6	
Net International	-0.8	
Consumption	311.6	
1963 - Projected GNP	580.1	
Business Investment	86.7	
Government	116.2	
Net International	1.9	
Consumption	375.3	
1964 - Projected GNP	604.5	
Business Investment	91.0	
Government	122.3	
Net International	2.6	
Consumption	388.8	
1965 - Projected GNP	633.0	644.2
Business Investment	96.0	96.9
Government	128.5	146.2
Net International	3.4	3.4
Consumption	405.1	397.7
1966 - Projected GNP	661.4	
Business Investment	100.8	
Government	133.6	
Net International	3.9	
Consumption	423.1	
1970 - Projected GNP	791.3	817.9
Business Investment	119.7	118.2
Government	159.6	178.0
Net International	6.0	6.0
Consumption	506.0	515.7
1971 - Projected GNP	827.0	
Business Investment	127.4	
Government	167.4	
Net International	6.7	
Consumption	525.5	

Sources for Table B-I (cont.)

11. Resources for Freedom, a Report to the President by the President's Materials Policy Commission (William S. Paley, chairman), Washington, June 1952, Vol. I, p. 6. The authors of this report estimate that the economy will grow at a rate of 3 percent per year, doubling its 1950 size by 1975. They present actual 1950 GNP figures and an explicit projection for 1975, in 1939 dollars:

	Billions of 1939 Dollars
1950 - Actual GNP	$154.3
1975 - Projected GNP	308.6

12. A Ten-Year Projection of Railroad Growth Potential, prepared by Transportation Facts, Inc. for the Railway Progress Institute, Chicago, November 1956, p. 16. This booklet presents a preliminary estimate of actual 1955 GNP, and explicit projections of GNP and consumption for 1960 and 1965, as follows:

	Billions of 1955 Dollars
1955 - Actual GNP (preliminary estimate)	$387.2
Consumption	252.3
1960 - Projected GNP	446
Consumption	300
1965 - Projected GNP	535
Consumption	375

13. The Challenge to America: Its Economic and Social Aspects, Special Studies Project Report IV, Rockefeller Brothers Fund, Garden City, New York, 1958, pp. 71, 72. This report shows actual 1957 GNP (preliminary estimate), and three alternative explicit projections for 1967--A, at a 3 percent annual growth rate; B, at a 4 percent annual growth rate; and C, at a 5 percent annual growth rate:

Sources for Table B-I (cont.)

	Billions of 1957 Dollars
1957 - Actual GNP (preliminary estimate)	$434
Business Investment	67
Government	86
Consumption	281
1967 - Projected GNP (A)	583
Business Investment	100
Government	127
Consumption	356
1967 - Projected GNP (B)	642
Business Investment	112
Government	127-153[1/]
Consumption	403-377[1/]
1967 - Projected GNP (C)	707
Business Investment	123
Government	153
Consumption	431

1/ The first figure assumes meeting a low estimate of demands for government expenditures; the second figure, meeting a high estimate of demands.

14. Bonnar Brown, GNP Projections, unpublished memorandum, Stanford Research Institute, September 1959, pp. 1, 20. This memorandum brings up to date the Institute's Production Trends in the United States through 1975 (March 1957), (shown above). In the revision, the author presents 1955 actual GNP and explicit projections for 1960, 1965, 1970, and 1975, all in 1947 dollars:

	Billions of 1947 Dollars
1955 - Actual GNP	$327.9
1960 - Projected GNP	379.2
1965 - Projected GNP	453.5
1970 - Projected GNP	546.0
1975 - Projected GNP	654.3

Sources for Table B-I (cont.)

15. Pulp, Paper and Board Supply-Demand, Report of the Committee on Interstate and Foreign Commerce, prepared by the Business and Defense Services Administration, Department of Commerce, 85th Congress, 1st Session, Washington, June 1957, p. 33. The Department of Commerce presents a preliminary estimate of actual 1956 GNP and explicit projections for 1958, 1960, and 1965, all in 1956 dollars:

	Billions of 1956 Dollars
1956 - Actual GNP (preliminary estimate)	$412.4
1958 - Projected GNP	440
1960 - Projected GNP	465
1965 - Projected GNP	540

16. U.S. Department of Labor, "Manpower - Challenge of the 1960's," 1960. GNP estimates to 1970 reflect economic projections prepared in connection with studies of manpower requirements as follows:

	Billions of 1957 Dollars
1957 - Actual GNP	$442.5
1965 - Projected GNP	599.3
1970 - Projected GNP	726.9

Table B-II

ADJUSTED PROJECTIONS OF GROSS NATIONAL PRODUCT 1960, 1964, and 1970 (Billions of 1959 Dollars)

Source	GNP Projections			Annual Rate of Growth from Rate of Projection or Nearest Year Explicitly Projected
	1960	1964	1970	
1. Fortune	$500.0[1]	$590.3	$750.0[1]	4.2%
2. General Electric				
A. Nat'l Security Expenditure of $55 billion in 1962	497.0	568.2	--	3.4
B. Nat'l Security Expenditure of $65 billion in 1962	501.6	580.6	--	3.7
3. A. S. Goldberger (The Nation)				
A. Nat'l Security Expenditure of $45 billion in 1962	476.3	540.1	--	3.2
B. Nat'l Security Expenditure of zero in 1962	471.8	511.2	--	2.2
4. Harvard Business Review				
A. Defense Expenditures of $48 billion in 1963	496.7	548.4	--	2.5
B. Defense Expenditures of $58 billion in 1963	503.9	600.0	--	4.5
5. Joint Committee on the Economic Report	517.4	577.8	711.8	3.2
6. Joint Economic Committee, Study Paper No. 20				
A. High potential growth @ 5.2%	504.0	617.3	838.7	5.2
B. Medium potential growth @ 4.7%	501.6	602.8	794.8	4.7
C. Low potential growth @ 4.2%	499.2	588.6	753.3	4.2
7. L. H. Keyserling	527.7	641.2[1]	--	5.0
8. McGraw-Hill	501.5	590.2	721.6	3.7
9. National Industrial Conference Board	502.1	603.6	786.0[1]	4.7
10. National Planning Association				
A. Judgment Model	518.7	604.2[1]	791.2[1]	3.9
B. High Growth—High Government Model	528.6	619.0	817.0[1]	4.1
11. Paley Report	475.5	531.0	627.1	2.8
12. Railway Progress Institute	494.6[1]	572.5	--	3.7
13. Rockefeller Bros. Fund, Inc.				
A. Proj. of 3% annual growth	491.2	552.6	660.9	3.
B. Proj. of 4% annual growth	506.9	591.9	748.7	4.
C. Proj. of 5% annual growth	520.5	632.6	847.8	5.
14. Stanford Research Institute	512.9[1]	592.0	736.5[1]	3.0
15. U.S. Department of Commerce	499.1[1]	562.5	--	2.0
16. U.S. Department of Labor	514.0[1]	587.4	744.0[1]	3.8

1/ Explicit projection.

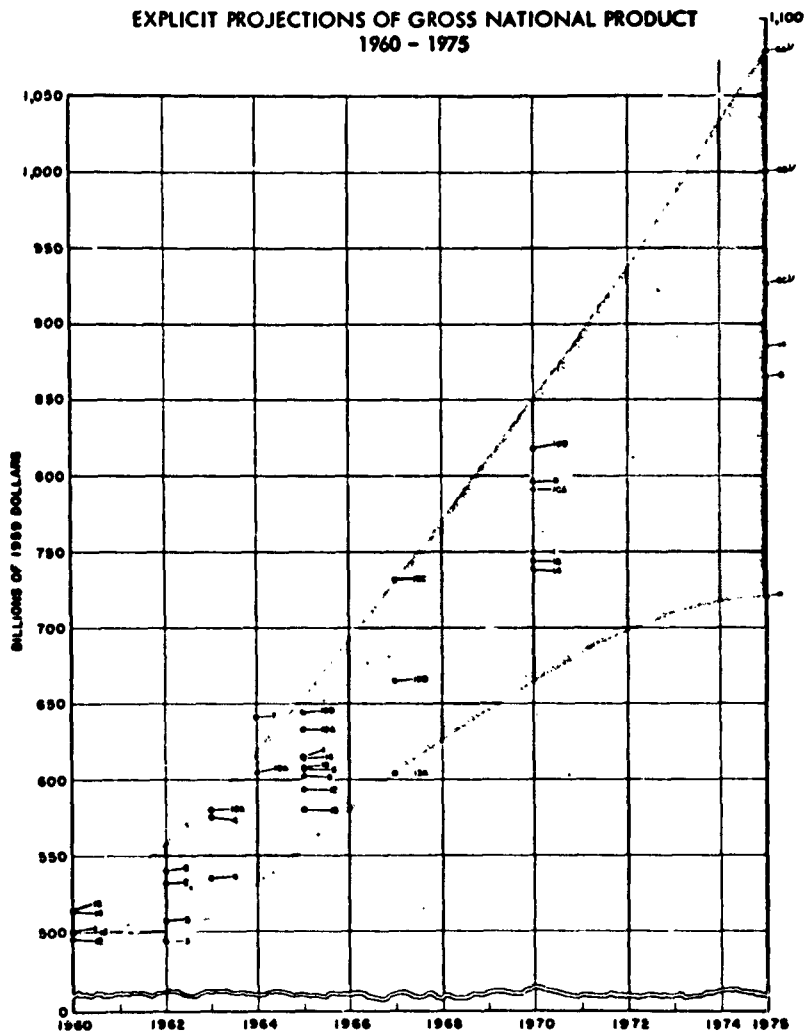
Sources: Same as Table B-1. These interpolations and extrapolations were obtained by using the implicit per annum growth rate of the original projection interpolated or extrapolated to the relevant target years.

DATA SOURCES FOR FIGURE B-1

1. FORTUNE
2. GENERAL ELECTRIC
3. A. S. GOLDBERGER (THE NATION)
4. HARVARD BUSINESS REVIEW
5. JOINT COMMITTEE ON THE ECONOMIC REPORT
6. JOINT ECONOMIC COMMITTEE, STUDY PAPER NO. 20
7. L. H. KEYSERLING
8. McGRAW-HILL
9. NATIONAL INDUSTRIAL CONFERENCE BOARD
10. NATIONAL PLANNING ASSOCIATION
11. PALEY REPORT
12. RAILWAY PROGRESS INSTITUTE
13. ROCKEFELLER BROS. FUND, INC.
14. STANFORD RESEARCH INSTITUTE
15. U.S. DEPARTMENT OF COMMERCE
16. U.S. DEPARTMENT OF LABOR

FIGURE B-1

EXPLICIT PROJECTIONS OF GROSS NATIONAL PRODUCT
1960 - 1975



1/ Note that Knowles's projections are for potential GNP, and are therefore higher than others.

SOURCE: Table B-1.

between projections if these overlapped any of the years of the 1964 target period. (See also Figure B-2.) Table B-II also lists the projected percent rate of growth, occasionally explicit in the original projection but generally calculated by us on the basis of the dollar value of the projections and the rate of gross national product at the time the projections were made. These rates of growth varied from lows of 2.2 percent (Goldberger on the basis of an alternate projection on the hypothetical assumption that expenditures for defense were cut to zero in 1962) and 2.8 percent (the 1952 Paley report projection to 1975) to highs of 5 percent by Keyserling and as one of the alternate possibilities suggested in the Rockefeller Brothers report. The interpolated and extrapolated projections for 1964 varied from a low of $511 billion to a high of $641 billion. The minimum 1964 projection is some $32 billion above the rate of GNP for 1959, and the maximum 1964 projection is $162 billion above this 1959 rate.

In view of the considerable variety in dates of the original projections and the liberties we had already taken in our transformations, we have sought to improve the transformations by making use of the most recent data on actual gross national product, data not generally available to the authors of the projections. Thus we applied the percent rates of growth implicit or explicit in the original projections (listed in Table B-II) to our actual 1959 gross national product. The results, which we would hazard are, all in all, as good and up-to-date a set of projections as can be obtained from the original data, are presented in Table B-III. Including only those projections based upon assumption of an unchanged aggregate defense program, we find now that the 1964 projections range from a low of $551 billion (again the Paley report) to a high of $618 billion.

Table B-III

ADJUSTED PROJECTIONS OF GROSS NATIONAL PRODUCT 1960, 1964, AND 1970 FROM BASE OF ESTIMATED GROSS NATIONAL PRODUCT OF $479 BILLION[1/]

(Billions of 1959 Dollars)

Source	GNP Projections		
	1960	1964	1970
1. Fortune	$499.8	$590.2	$757.1
2. General Electric			
A. Nat'l Security Expenditure of $55 billion in 1963	495.8	566.8	--
B. Nat'l Security Expenditure of $65 billion in 1963	497.3	575.6	--
3. A. S. Goldberger (The Nation)			
A. Defense Expenditures of $45 billion in 1963	494.8	561.0	--
B. Defense Expenditures of zero in 1963	490.1	538.1	--
4. Harvard Business Review			
A. Defense Expenditures of $48 billion in 1963	491.8	542.8	--
B. Defense Expenditures of $58 billion in 1963	501.1	597.8	--
5. Joint Committee on the Economic Report	498.0	562.4	680.9
6. Joint Economic Committee, Study Paper No. 20			
A. High potential growth @ 5.2%	504.4	617.8	837.4
B. Medium potential growth @ 4.7%	502.0	603.3	794.7
C. Low potential growth @ 4.2%	499.6	589.0	753.9
7. L. H. Keyserling	503.5	612.0	--
8. McGraw-Hill	497.3	575.3	715.6
9. National Industrial Conference Board	502.1	603.6	796.0
10. National Planning Association			
A. Judgment Model	498.2	580.6	730.4
B. High Growth--High Government Model	502.0	585.3	743.7
11. Paley Report	493.0	550.8	660.4
12. Railway Progress Institute	497.3	575.3	--
13. Rockefeller Bros. Fund, Inc.			
A. Proj. of 3% annual growth	493.9	555.9	663.7
B. Proj. of 4% annual growth	498.7	583.4	738.2
C. Proj. of 5% annual growth	503.5	613.0	830.1
14. Stanford Research Institute	497.0	573.3	710.6
15. U.S. Department of Commerce	494.0	556.7	--
16. U.S. Department of Labor	498.3	569.5	700.1

1/ Projections for 1960, 1964, and 1970 have been calculated by applying to our estimate of actual GNP the annual growth rate (implicit or explicit) of the original projection.

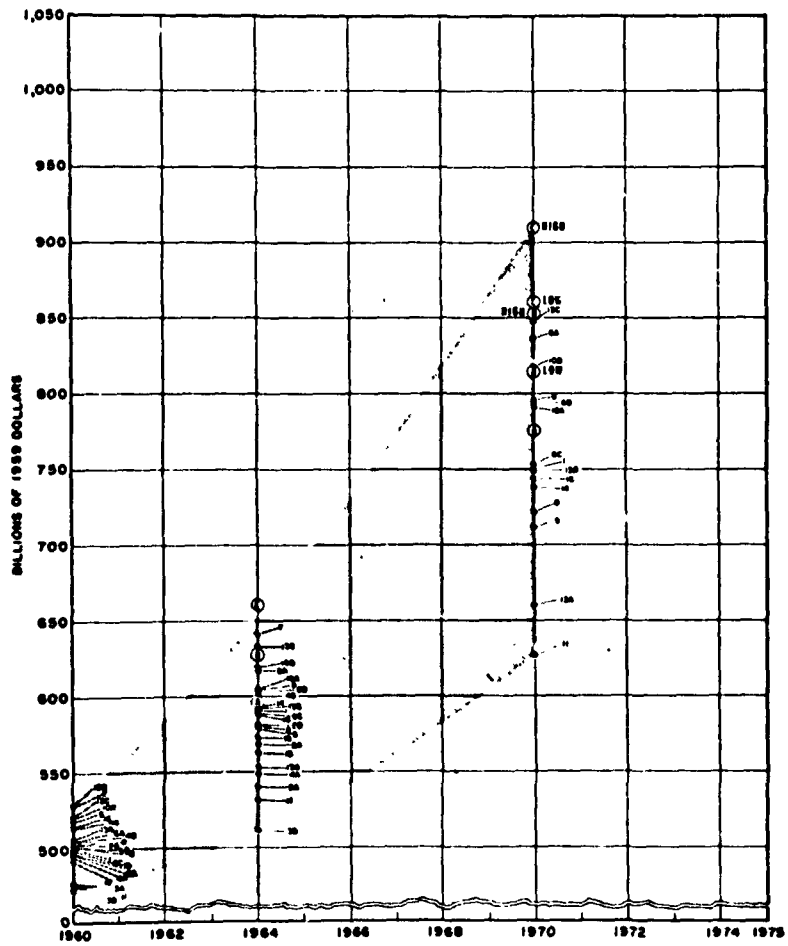
Sources: Same as Table B-I.

DATA SOURCES FOR FIGURE B-2

1. FORTUNE
2. GENERAL ELECTRIC
3. A. S. GOLDBERGER (THE NATION)
4. HARVARD BUSINESS REVIEW
5. JOINT COMMITTEE ON THE ECONOMIC REPORT
6. JOINT ECONOMIC COMMITTEE, STUDY PAPER NO. 20
7. L. H. KEYSERLING
8. McGRAW-HILL
9. NATIONAL INDUSTRIAL CONFERENCE BOARD
10. NATIONAL PLANNING ASSOCIATION
11. PALEY REPORT
12. RAILWAY PROGRESS INSTITUTE
13. ROCKEFELLER BROS. FUND, INC.
14. STANFORD RESEARCH INSTITUTE
15. U.S. DEPARTMENT OF COMMERCE
16. U.S. DEPARTMENT OF LABOR

FIGURE B-2

ADJUSTED PROJECTIONS OF GROSS NATIONAL PRODUCT
1960, 1964, AND 1970



SOURCE: Table B-2.

Appendix C

INVESTMENT REQUIREMENTS FOR LONG-TERM GROWTH

Table C-I

INVESTMENT REQUIREMENTS FOR 1970 PROJECTIONS
BY TYPE OF INVESTMENT
(Percent of GNP)

	Projection				
	A	B		C	
		Low	High	Low	High
1. Nonfarm Producers' Equipment	8.1 %	8.1 %	9.6 %	8.1 %	9.6 %
2. Nonfarm Producers' Plant	3.1	3.1	3.1	3.1	3.1
3. Adjustment for GE/GNP	--	-0.18	-0.19	-0.39	-0.44
4. Farm Equip. & Construction	0.80	0.76	0.76	0.68	0.68
5. Residential Construction	4.5	4.3	4.2	3.7	3.5
6. Other Private Construction	0.68	0.65	0.65	0.58	0.58
7. Net Change in Business Inventories	0.70	0.69	0.69	0.65	0.65
Total Gross Private Domestic Investment	17.88%	17.42%	18.81%	16.42%	17.67%
8. Net Exports	0.56	0.53	0.53	0.48	0.48
Total Private Investment (I)	18.44%	17.95%	19.34%	16.90%	18.15%
Rounded for Projections	18	18	19	17	18

Line 1. Nonfarm producers' equipment is the largest single investment category and the most significant for the GNP growth rate. The amount of equipment per person in the labor force (or, more properly, in the private labor force) has a strong long-term upward trend. GNP per employed person has also been rising, and new equipment has been a fairly steady 5 to 6 percent of GNP since the war, except for some slippage in 1958 and 1959:

Table C-I (cont.)

1947	6.1%	1954	5.1%
1948	6.3	1955	5.2
1949	5.6	1956	6.0
1950	5.7	1957	5.9
1951	5.6	1958	4.6
1952	5.4	1959	4.3
1953	5.3	1960	5.1 est.

However, these are calculated from the data in current dollars (Economic Report of the President, 1960, Tables D-1 and D-8). In 1959 dollars, the share of investment in producers' equipment has been declining since the war, since the prices of such equipment have risen much more rapidly than the average for all goods and services. The constant-dollar basis is the appropriate one, however, since we are concerned with the provision of enough real equipment to sustain the projected real output, whether or not it costs more to provide it. Accordingly, we shall base our estimates on the data tabulated below, thus being conservative (i.e., being careful not to underestimate investment requirements):

	Producers' Equipment	Net New Equipment	Replacement	Percent Replacement	Share of GNP		
					Total	New	Replacement
	(billions of 1959 dollars)				(percent)		
1947	$26.4	$14.4	$12.0	45%	8.4%	4.6%	3.8%
1948	27.7	16.8	10.9	39	8.4	5.1	3.3
1949	24.1	14.8	9.3	39	7.3	4.5	2.8
1950	25.9	13.6	12.3	47	7.3	3.8	3.5
1951	26.8	13.2	13.6	51	7.0	3.5	3.5
1952	26.5	13.6	12.9	49	6.6	3.4	3.2
1953	27.4	13.4	14.0	51	6.6	3.2	3.4
1954	25.3	12.1	13.2	52	6.2	3.0	3.2
1955	27.4	11.3	16.1	59	6.2	2.6	3.6
1956	30.4	12.8	17.6	58	6.7	2.8	3.9
1957	30.0	13.2	16.8	56	6.5	2.9	3.7
1958	23.4	9.5	13.9	59	5.0	1.9	3.1
1959	26.1	10.7	15.4	59	5.5	2.2	3.2
1947-55 Average					7.1	3.7	3.4
1947-59 Average					6.7	3.3	3.4

Table C-I (cont.)

The first column is taken from the Economic Report of the President, 1960, Table D-2. The second column is derived from National Economic Projections, 1960, Table 22; this table gives the gross stock of private equipment, on the basis of data in Capital Goods Review No. 39, Machinery and Allied Products Institute, September 1939, from which we have calculated here the annual increments. This we take to represent new equipment, in the sense that it represents net additions to capital stock (undepreciated). The third column is the difference of the first two, which we take to reflect replacements (plus equipment charged to current expense--"nondurable goods"). Note that replacements of retired equipment may add to capacity. Note also that the capital stock figures include agricultural equipment, whereas the total equipment series does not; thus, we are slightly overestimating "new" equipment, at the expense of replacements—again, statistically conservative in the effect on the estimates. Offsetting this (probably only partially) is the fact that the capital stock series excludes government-owned equipment, which is purchased out of the total series in the first column.

Let us consider column two first. The average for the 13-year period is 3.3 percent of GNP. This rate of investment was associated with 3.5 percent average growth in real GNP. (It might be argued that there is a time lag between expenditures for new equipment and product reflecting the increase in stock. Since we have only annual data here, a check was made by computing the 1946-58 average, introducing a one-year lag; the average was not affected, at the two-significant-digit level.) This is probably an overestimate of the relationship between growth of capital stock and growth of GNP; the 1947-55 average of 3.7, which is high because of the postwar "catch-up" years, 1947-49, was associated with a GNP growth rate of 4.3 percent; and the 1955-59 slowdown, while matched by a slowdown in GNP growth to 2.0 percent, was not matched by a comparable slowdown in the growth of potential GNP—Knowles figure, for the latter is 4.0 percent average growth, 1947-59. But again, to be conservative, we use the 3.3:3.5 ratio; assuming linearity, this gives us 4.2 percent for a 4.5 percent growth rate, and 5.2 percent for 5.5 percent GNP growth. (It might be more precise to relate equipment requirements to the output of goods alone, rather than goods and services. The growth of the Federal Reserve Index of Industrial

Production could be used--it rose at 4.0 percent, 1947-59. The results are not affected, if one assumes a continuation of the postwar tendency of that index to rise more rapidly than real GNP continues; this seems a reasonable assumption for our projections.)

As a check on the adequacy of these allowances for net new equipment, the resultant increases in capital stock by 1970 have been calculated. As a short-cut, this has been done by means of the conventional formula for the amount of an annuity:

$$\sum = \frac{a\,(r^n - 1)}{r - 1}$$, where $r = 1 + i$ (i = growth rate, in decimal form),

$a = j\ GNP_{59}$ (j = share of GNP for new equipment)

Thus, it is assumed that the allocations to investment grow at a uniform rate, the average for the GNP in each projection (see Table XIX). This means that if there is postponement during the rapid buildup to 1964, it is made up in the intervening years, or in 1961, when a decision to build up might lead to anticipatory increases in investment. This assumption and the approximative method of calculation introduce only slight distortions from the results that could be expected from a year-by-year calculation--distortions well within the range of error of this kind of estimate. Using the formula, we get a private stock of equipment of $675 billion to $773 billion, which reflects growth at 6.6 to 7.9 percent from the $334 billion for 1959. This compares with 1947-59 growth at 5.4 percent a year. National Planning Association also compares the value of private stock with the private labor force (ibid., Table 24), and shows a growth rate of 4.4 percent a year, 1947-55, in stock of equipment per person in the private labor force. Since we have made no assumptions about the difference between total and private labor force in our projections, we have made the corresponding comparison with total labor force, as used throughout this study. We find an average annual increase of 5.0 to 6.1 percent in stock per person in each of the projections; this compares with the average increase of 5.2 percent for 1947-55, in the National Planning Association series, which is consistent with our assumption of at least as rapid productivity increase as in the 1947-55 period, or greater in the 5.5 percent projections.

To the percentages of GNP for accretions to capital stock must be added allowances for equipment replacement (some of which, as noted above, also contributes to growth). As we have seen in the above tabulation, replacement equipment has been a remarkably stable share of GNP; it averaged 3.4 percent for 1947-59, while GNP was growing at 3.5 percent. The same 3.4 percent average obtained for 1947-55, when GNP was growing at 4.3 percent. This is reasonable, as replacement is related to total stock and so is highly insensitive to the rate of growth. Nevertheless, since our projections assume high productivity improvement factors, we shall assume that obsolescence is accelerated, and so we shall make the generous (statistically conservative) assumption that the replacement rate rises by 50 percent of the increase in GNP growth rates, i.e., that when growth goes from 3.5 to 4.5 percent, replacement requirements go from 3.4 to 3.9 percent, and when GNP grows at 5.5 percent, replacement will be at 4.4 percent. These figures, added to the 4.2 and 5.2 percent, respectively, estimated above for "new" equipment, give us the 8.1 and 9.6 percent estimates shown on line one of Table C-I. Thus, in 1970, 48 percent of all producers' equipment is allowed for replacement in the 4.5 percent growth projections; 46 percent in the 5.5 percent projections.

Line 2. Nonfarm producers' plant can be estimated by a similar procedure to that used for producers' equipment. The data are as follows:

	Plant	Net New Plant	Replacement	Share of GNP: Total	Share of GNP: New	Share of GNP: Replacement
	(billions of 1959 dollars)			- - - - (percent) - - - -		
1947	$ 9.3	$6.3	$3.0	2.9%	2.0%	0.9%
1948	9.9	5.9	4.0	3.0	1.8	1.2
1949	9.6	5.2	4.4	2.9	1.6	1.3
1950	10.1	5.0	5.1	2.8	1.4	1.4
1951	11.7	5.9	5.8	3.0	1.5	1.5
1952	11.8	6.7	5.1	3.0	1.7	1.3
1953	13.0	7.0	6.0	3.1	1.7	1.4
1954	13.2	7.3	5.9	3.2	1.8	1.4

Table C-I (cont.)

	Plant	Net New Plant	Replacement	Share of GNP: Total	Share of GNP: New	Share of GNP: Replacement
	(billions of 1959 dollars)			(percent)		
1955	$14.9	$7.9	$7.0	3.4%	1.8%	1.6%
1956	15.6	9.0	6.6	3.5	2.0	1.5
1957	15.8	9.6	6.2	3.4	2.1	1.3
1958	14.1	8.8	5.3	3.1	1.9	1.2
1959	13.7	7.9	5.8	2.9	1.7	1.2
1947-55 Average				3.0	1.7	1.3
1947-59 Average				3.1	1.7	1.3

Increases in the stock of producers' plant does not appear to be significantly correlated with the rate of growth of GNP (over the long term). As these figures show, total plant has lagged behind GNP. It has been virtually constant (or slightly declining) in relation to the (private) labor force from 1925 until after World War II. It rose at 1.3 percent a year on a per person basis, 1947-59 (see National Planning Association, ibid., Table 24). Producers' plant includes commercial as well as industrial construction; examination of the data (Economic Report of the President, 1960, Table 31) shows that the growth above that of the labor force is entirely due to the postwar boom in commercial construction. Using 1.7 percent of GNP, and the labor force figures from our projections, gives, by the same procedure as that used above for new equipment, a continuation of the 1.3 percent annual increase in plant per person in the labor force, 1959-70, in each projection, that we observed for 1947-59. Accordingly, we use the 1.7 figure, plus 1.3 percent of GNP for replacement, or a total of 3.1 percent (the discrepancy being due to rounding). Since plant is a decreasing proportion of GNP, this is probably an overestimate, particularly for the higher models; it gives an accelerating rate of growth of the total plant, starting with the postwar average of 1.9 percent a year (from $282 billion to $368 billion, 1947 to 1959).

Line 3. It has already been noted that government, or public, investment should be deducted from total investment requirements to estimate net private investment requirements. When GE/GNP is constant,

this factor can be ignored, on the assumption that the trends of the two sectors will be parallel. However, the ratio ranges from 20 to 32 percent in our projections, as against an average of 18 percent in the 1947-59 base period. We have arbitrarily assumed that the government will pay for 25 percent of the incremental investment in producers' plant and equipment required to meet the increment in GE due to the increase in GE/GNP over the base period. Perhaps 25 percent will turn out to be high, but offsetting this is the fact that we do not apply the adjustment to any other investment sectors, as for example, government housing and other facilities in areas in which expanding government employment creates additional needs. In any event, the adjustment is small (and omitted as negligible in Projection A). It is computed by the formula:

$$.25\ (GE/GNP - .18)\ (I_{producers}/GNP\text{—lines 1 \& 2})$$

Line 4. Since agriculture produces goods intended for the most part for consumption (C), it is more logical to relate it to consumption than to GNP, particularly when the proportion of GE, and therefore of consumption, changes widely. Because in our projections the order of determination is first GPE, then investment, then consumption, it will be convenient to relate agricultural investment to GPE rather than to C; the relative stability of C/GPE means that only very small distortions will be introduced by this procedure. But the correlation of farm investment with either GPE or C is not linear. As is well known, when incomes rise people spend proportionately less on food; similarly, as GNP has risen, the proportion of agricultural output has declined, and the proportion of investment required to sustain it has also declined. Since the relationship of new equipment to construction on the farms has been relatively stable (roughly 5:3), it is not necessary to consider the two separately, as it was in the case of nonfarm producers' plant and equipment. The following series is derived from Table D-8 in the Economic Report of the President, 1960 (Farm Equipment and Construction as Percent of GPE):

1947	1.6%	1954	1.4%
1948	1.9	1955	1.3
1949	2.0	1956	1.1
1950	1.7	1957	1.0
1951	1.8	1958	1.3
1952	1.7	1959	1.3
1953	1.6		

In a decade the decline has been some 30 to 35 percent. We will allow a 25 percent decline in the next decade, giving 0.98 percent, which we round to 1.0, in 1970. This is converted to percent of GNP in the table.

Line 5. Second only in importance to producers' equipment is housing. Here again, we have a factor more logically related to consumption than to GNP. And the item is sufficiently important that we cannot this time use GPE as a surrogate variable for C.

The results in the table were therefore arrived at by successive approximations to be consistent with the consumption figures in Table XIX, which were derived by deducting the investment requirements from GPE. From Tables D-1 and D-8 of the Economic Report of the President, 1960, we derive housing as a percent of consumption. (Strictly speaking, we should perhaps compute housing as a percentage of consumption plus housing, but this would considerably complicate our procedures for a trivial gain in precision.)

1947	4.5%	1954	6.5%
1948	5.7	1955	7.3
1949	5.3	1956	6.6
1950	7.2	1957	6.0
1951	6.0	1958	6.1
1952	5.8	1959	7.2
1953	5.9		

This is, of course, a gross oversimplification of the housing demand story. A full analysis would include a study of the trend of household formation, trends in the size, quality, and price of houses, elasticity of housing demand at the levels of consumer income we are projecting, interest rates, and perhaps a number of other factors. For our present purposes, however, this procedure tends to make a generous allowance for housing, which probably, among other things, should not rise so rapidly with consumption in our higher projections. We will use 7 percent of consumption (to take some account of higher rates of family formation than during the fifties) and reduce to percent of GNP by the iterative procedure indicated in this note, above.

Line 6. Other private construction includes a variety of institutional (e.g., churches, hospitals) categories. Again, it seems to be primarily related to GPE, with a rising trend (again based on Table D-8, Economic Report):

1947	0.24%	1954	0.59%
1948	.40	1955	.56
1949	.50	1956	.56
1950	.53	1957	.62
1951	.52	1958	.71
1952	.48	1959	.68
1953	.50		

While the trend appears to be accelerating, it cannot be expected to do so indefinitely. An estimate of 0.85 percent of GPE seems reasonably generous for 1970. This is translated into percent of GNP in the table.

Line 7. Inventory accumulation varies widely from year to year, but in the long run it must of course bear a reasonably stable relationship to GNP. However, when GE rises sharply, inventories do not necessarily keep pace. While doing business with the government certainly requires inventories, the finished goods are largely, and the work-in-process and raw materials are sometimes partially, carried by the government. And there is less short-term uncertainty about orders. Unfortunately, short-term speculative swings during periods of sharply rising GE in the past make it difficult to draw any quick statistical conclusions. We shall allow 50 percent as much inventory accumulation for increments in GE as for increments in GPE. Annual investment in added inventory averaged 0.87 percent of GPE and 0.71 percent of GNP from 1947 to 1959, when GE averaged 18 percent of GNP. We have not attempted to adjust these figures for the recent trend toward "LIFO," or last-in-first-out accounting, which may have raised the figures somewhat, nor do we allow for any possible economies in the next decade to be realized from improved estimating, accounting, and materials handling techniques. The figures in the table are computed from the 0.87 percent of GPE, on the formula stated above.

Line 8. It was noted in Chapter 5 that high GE may tend to depress net exports. It was also observed that the coming decade may require measures to improve the net export position, as part of the solution to the balance of payments "problem." We will relate net exports to GPE, rather than directly to GNP, and even this may tend to overestimate under Projection C. We will assume that by 1970 the balance of trade picture will be stabilized at somewhat higher than recent levels. The following figures (derived from Table D-1 in the Economic Report of the President, 1960) show the wide fluctuations of NE as a percent of GPE:

1947	4.4%	1954	0.3%
1948	1.6	1955	0.3
1949	1.7	1956	0.9
1950	0.2	1957	1.4
1951	0.9	1958	0.3
1952	0.5	1959	-0.2
1953	0.3		

We shall assume 0.7 percent of GPE for 1970, converting to percent of GNP in the table.

BIBLIOGRAPHY

BIBLIOGRAPHY

Angell, James W. Investment and Business Cycles. New York: McGraw-Hill. 1941.

Bach, George Leland. Economics. Englewood Cliffs, New Jersey: Prentice-Hall. 1960.

Bator, Francis M. The Question of Government Spending. New York: Harper & Brothers. 1960.

Break, G. F. "Income Tax and Incentives to Work: An Empirical Study," American Economic Review, September 1957.

_____. "Income Taxes, Wage Rates and Incentives to Supply Labor Services," National Tax Journal, December 1955.

Brown, Bonnar. GNP Projections, unpublished memorandum of September 1959, updating Production Trends in the United States through 1975. Menlo Park, California: Stanford Research Institute. March 1957.

Burck, Gilbert, and Todd May. "The Good Uses of $750 Billion," Fortune, April 1959.

Clague, Ewan, and others. "Productivity in Industry, A Round Table Discussion," Studies in Business Economics, Number 51, National Industrial Conference Board, 1956.

Committee for Economic Development. National Objectives and the Balance of Payments Problem. New York. February 1960.

Creamer, Daniel. Capital and Output Trends in Manufacturing Industries, 1880-1948, National Bureau of Economic Research, Occasional Paper 41, 1954.

Dale, William B. The Foreign Deficit of the U.S., Causes and Issues. Menlo Park, California: Stanford Research Institute. April 1960.

Domar, Evsey D. Essays in the Theory of Economic Growth. New York: Oxford University Press. 1957.

Dowd, Laurence P. "Is the United States being Priced out of World Markets?" Journal of Marketing, July 1960.

Drucker, Peter. "Three Unforeseen Jobs for the Coming Administration," Harper's Magazine, July 1960.

Eckstein, Otto. Trends in Public Expenditures in the Next Decade. Committee for Economic Development. New York, April 1959.

Economic Report of the President. Washington: Government Printing Office. January 1960.

Eisner, Robert. The Influence on Prices of Changes in the Effective Supply of Money, Hearings on Employment, Growth, and Price Levels, Part 4, Joint Economic Committee, Congress of the United States. Washington: Government Printing Office. 1959.

Fabricant, Solomon. Basic Facts on Productivity Change, National Bureau of Economic Research, Occasional Paper 63, 1959.

_____. Productivity of Labor in Peace and War, National Bureau of Economic Research, Occasional Paper 7, 1942.

Fabricant Solomon, and others. "The 'Miracle' of Productivity," Studies in Business Economics. Number 9, National Industrial Conference Board, 1947.

Goldberger, A. S. "Conversion: The Magnitude of the Task," The Nation, March 28, 1959.

Goldsmith, Raymond W., and others. The Comparative Study of Economic Growth and Structure. National Bureau of Economic Research. 1959.

Gordon, Robert A. Business Fluctuations. New York: Harper & Brothers. 1952.

Haavelmo, T. "Multiplier Effects of a Balanced Budget," Econometrica, October 1945.

Haberler, Gottfried. "Multiplier Effects of a Balanced Budget; Some Monetary Implications of Mr. Haavelmo's Paper," Econometrica, April 1946.

_____. Prosperity and Depression. Cambridge, Mass.: Harvard University Press. 1958.

Hansen, A. H., and H. S. Perloff. State and Local Finance in the Economy. New York. 1944.

Harriss, C. Lowell. The American Economy. Homewood, Illinois: Irwin. 1959.

Hekhuis, Dale J. The Economics of US-USSR National Security Expenditures. Technical Military Planning Operating Report. Santa Barbara, California: General Electric Co. January 1958.

Helzner, Manuel L. "Import of More Defense Dollars," Harvard Business Review. March-April 1960.

Homan, Paul T., Albert Gailord Hart, and Arnold W. Samitz. The Economic Order. New York: Harcourt, Brace & Co. 1958.

Joint Economic Committee, Congress of the United States. Comparisons of the United States and Soviet Economies, prepared by the Central Intelligence Agency in cooperation with the Depts. of State and Defense. Washington: Government Printing Office. June 1960.

_____. Federal Tax Policy for Economic Growth and Stability. Washington: Government Printing Office. 1955.

_____. Potential Economic Growth of the United States during the Next Decade, Materials prepared by the Committee Staff. Washington: Government Printing Office. 1954.

Kaldor, N. "The Quantitative Aspects of the Full Employment Problem in Britain," Appendix C in W. H. Beveridge, Full Employment in a Free Society. New York. 1945.

Kendrick, John W. Productivity Trends: Capital and Labor. National Bureau of Economic Research, Occasional Paper 53, 1956.

Kendrick, M. Slade. A Century and a Half of Federal Expenditures, National Bureau of Economic Research, Occasional Paper 48, 1955.

Keyserling, L. H. "Next Step, a 600 Billion Dollar Economy?" New York Times Magazine, November 23, 1958.

Knowles, James W. The Potential Economic Growth in the United States, Study Paper 20, Joint Economic Committee, Congress of the United States. Washington: Government Printing Office. 1960.

Kuznets, Simon. Uses of National Income in Peace and War, National Bureau of Economic Research, Occasional Paper 6, 1942.

McGraw-Hill Department of Economics. The American Economy: Prospects for Growth to 1965 and 1975, New York: McGraw-Hill Book Co. 1958.

Mills, Frederick C. Productivity and Economic Progress, National Bureau of Economic Research, Occasional Paper 38, 1952.

National Accounts Review Committee of the National Bureau of Economic Research. The National Economic Accounts of the United States, Hearings before the Subcommittee on Economic Statistics of the Joint Economic Committee, 85th Congress. Washington: Government Printing Office. 1958.

National Industrial Conference Board. Defense Economics, the First Year. NICB. 1951.

_____. The Economic Almanac, 1958. Thomas Y. Crowell Company. 1959.

_____. Economic Growth in the 1960's. NICB. 1960.

National Planning Association. National Economic Projections, 1960. Washington. 1960.

Paley, William S., et al. Resources for Freedom, A Report by the President's Materials Policy Commission. Washington. June 1952.

Peston, M. H. "Generalizing the Balanced Budget Multiplier," Review of Economics and Statistics. August 1958.

Raushenbush, Stephen. Productivity and Employment, 1955-1965. Public Affairs Institute. 1956.

Rockefeller Brothers Fund. The Challenge to America: Its Economic and Social Aspects, Special Studies Report IV. Garden City, New York. 1958.

Salant, W. A. Review of Economics and Statistics, "Comment" on paper of M. H. Peston (see above). August 1958.

_____. "Taxes, Income Distribution and the Balanced Budget Theorem," Review of Economics and Statistics.

Sanders, T. H. Effects of Taxation on Executives. Boston: Harvard Business School. 1951.

Stigler, George J. Trends in Output and Employment. National Bureau of Economic Research. 1957.

Tax Institute. Limits of Taxable Capacity. 1953.

Thorp, Willard L., and Richard E. Quandt. The New Inflation. McGraw-Hill Book Co. 1959.

Transportation Facts, Inc. A Ten-Year Projection of Railroad Growth Potential, prepared for the Railway Progress Institute, Chicago. November 1956.

U.S. Department of Commerce, Business and Defense Services Administration. Pulp, Paper and Board Supply-Demand. Report of the Committee on Interstate and Foreign Commerce, 85th Congress, 1st Session. Washington: Government Printing Office. June 1957.

U.S. Department of Commerce. Annual Report on the Labor Force, 1952-58, Current Population Reports, Series P-50, Washington: Government Printing Office.

_____. U.S. Income and Output. Washington: Government Printing Office. 1958.

U.S. Department of Labor, Bureau of Labor Statistics. Population and Labor Force Projections for the United States, 1960 to 1975, Bulletin No. 1242, June 1959.

U.S. Department of Labor. Manpower-Challenge of the 1960's. Washington: Government Printing Office. 1960.

Wallich, H. C. "Income-Generating Effects of a Balanced Budget," Quarterly Journal of Economics. November 1944.

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