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PART I

Treatment of War Output

1 Viewpoints on War Output

A major war alters the emphasis on the ends to which the productive system of a country is geared in peacetime. Different interpretations of this shift in emphasis lead to different treatments of war output, and estimates of national product will vary accordingly. We can assume that the huge drafts war production makes upon the country's resources represent a new purpose of economic activity, on a par with the one dominant in peacetime—supplying goods to ultimate consumers; or that this new purpose—providing commodities and services for the armed conflict—should be considered paramount during a major war; or that the peacetime aim of economic activity should be retained in war and supplying the armed conflict be treated as subordinate to it.

Before weighing these viewpoints and illustrating their effects statistically we consider other possible positions which seem at first to remove the necessity of choosing among several goals of economic activity. If national product could be estimated without making essentially arbitrary decisions concerning purposes, it would obviously be extremely desirable.[1]

[1] When in subsequent discussion we speak interchangeably of ultimate 'purposes', 'ends', 'goals', and 'objectives' we refer to the productive outcome of a nation's economy so far as it is intended and approved by the operative controls. Such aims are revealed by the functional scheme of the total economic system, whether set up by direct governmental action or established by long standing custom. It is not easy to formulate such aims consistently for periods during which an economy's functions and problems have been radically altered or for societies with widely divergent patterns of organization and diverse problems attacked by economic means. Yet by undertaking to estimate national product, i.e., the contribution of the economy to the achievement of the intended and approved aims, the statistician implies that he has a clear idea of what the society wants. While he may ease the burden of choice by making several formulations and calculating corresponding variants of national product, each variant implies some set of ultimate objectives. Reluctant as he may be to pose as a social philosopher and pass judgment upon the net result of the economic activities of millions of individuals, that is in fact what a national income estimator does, even when he tries to base his judgment upon a recognizable consensus of the society whose economy he is studying.

Obviously the terms 'purposes', 'ends', 'goals' as used here do not mean a sum total of the immediate aims of the individuals who participate actively in the economy. Probably most individuals are driven by the necessity to earn a living; some may seek economic gain as a basis for social prestige, others may be impelled by the instinct of workmanship or by a desire to render service to society; some may take a job from sheer boredom; and perhaps the great majority are animated by a mixture of motives. Even were it possible to add the immediate motives of individuals and strike a weighted average, the result would not be equivalent to the objectives to which the nation's economy is actually directed. Many societies, notably those organized democratically, leave a wide area for self-seeking individual initiative in the expectation of

a) It might be argued that war production, like the flow of goods to individuals and households, is determined largely by consumers, and that its growth to astronomical heights in a major war is due to a shift in public taste. True, taste is expressed in this case through the government rather than through market demands by individual purchasers. But even in peacetime consumers register some of their wants through the government; for example, for more schools or parks. The flow of goods to the armed conflict could then be interpreted as directly satisfying desires of ultimate consumers; i.e., as a new category in the flow of consumer goods. And just as we include in national product the full value of goods flowing to individuals and households, we would include the full value of goods flowing to the armed conflict.

This position is unassailable in formal logic, *if* we are free to interpret the wishes of ultimate consumers as we please. But we are not to the point of indulging in arbitrary imputations. Even in peacetime, consumers may be provided with goods through decisions by the government; but chiefly in the form of services directly related to the needs or wants of individuals and households (e.g., education, recreation). A decision to engage in a major war can hardly be motivated by a desire to instruct or amuse members of the armed forces and employees of war agencies; or to supply thrills to ultimate consumers by parading guns, airplanes, or battleships, or writing accounts of battles as sports events. And if it has other motivations, e.g., to preserve a social order cherished by a nation, and is thus a species of capital investment, then surely it cannot be interpreted in terms of tastes of ultimate consumers. If it could, so could all intermediate production in peacetime as well as all capital formation. Any product could then be considered final; for example, all ingot steel could be classified as a final product because steelmakers presumably make it at the behest of ultimate consumers.

b) To the extreme of saying that a collective decision to engage in a major war is on a par with the ordinary expressions of consumers' tastes in peacetime markets, the other extreme can be

Note 1 concluded:

public good. Society may tolerate the means for the sake of the gains. Adam Smith's theory of the unseen hand, that private selfishness works public benefit, still rules, if with many limitations, the democratic economy.

opposed: to view war production from the vantage of an assumed ideal organization of the world economy. If, for example, all international disputes were settled by peaceful means, and if no nation were concerned to amass instruments of war in order to challenge this mode of settlement, war production, should that be still conceivable, would add nothing whatever to national product, except so far as it might become available for nonwar consumption.

The advantage of appraising economic activity by criteria independent of the changing and mixed purposes pursued in the real world cannot be gainsaid. It might give new insight, a new basis for appraisal, and goals for reorienting society's approach to the economic and social problems of the day. But the estimate would not be one of national product as commonly thought of—the net contribution of economic activity to the goals of the United States in the 20th century. Society, as organized today, no more precludes armed conflict among nations than it forbids advertising food products of little or no value according to scientifically established standards of nutrition, or prevents the growth of huge urban centers on which scarce resources must be lavished to relieve the incommodities of congestion. So long as we attempt to measure the contribution of economic activity to what within the *national* framework are actually accepted as ends, war output cannot be dismissed as completely irrelevant and omitted without further ado from national product.

c) We might treat war as an unforecastable natural calamity, for which no calculable current provision can be made. Losses sustained in such disasters in peacetime are usually debited to the capital account, and are excluded from depreciation, depletion, and other costs that can be currently planned for and calculated; i.e., they are excluded from current capital consumption in the income account. Consequently, goods produced to replace losses occasioned by such natural calamities are fully included in net national product.[2] By analogy, losses due to war, in the way of destruction of assets, would be entered in the capital account; but the income account, i.e., net national product, would include war output as fully as it includes capital formation intended to replace losses

[2] See Solomon Fabricant, *Capital Consumption and Adjustment* (National Bureau of Economic Research, 1938), pp. 9-11, especially his references to Pigou's writings on the subject, p. 10, notes 4 and 5.

from natural calamities in peacetime—at gross value with the rather minor deduction of depreciation on war construction (i.e., plants producing munitions and military housing).

This viewpoint is akin to that discussed under (b), in the sense that it rejects an integral connection between the incidence of war and the organization of the nation's economic and social system, just as the viewpoint under (b) denies war as a pattern of behavior in an ideal system of world organization. But, paradoxically, the statistical effect of the position at issue is not to omit war output from national product completely, as is done under (b); but to include it fully, except for the minor item of depreciation on war construction. This different statistical effect is due to the additional assumption that net changes on capital account can be differentiated from capital consumption in the income account.

This position is not discussed for two reasons. First, we cannot bring ourselves to interpret war as a natural calamity rather than as, in large degree, a consequence of our social institutions and, therefore, closely connected with their functioning and costing them heavily. Second, the distinction between the capital and income account is tenable only so long as unforecastable disasters entail a capital loss small in comparison with capital consumption as a production cost in the income account. As losses from natural calamities in peacetime are small, their exclusion from the income account leads to but a minor exaggeration of the total net material product of society. Losses occasioned by major wars are hardly so small; and their complete exclusion from the income account would lead to its inflation to a point that might render it well nigh meaningless as a basis for estimating society's *net* product.

d) Regardless what war production means in terms of purpose, it represents an input of scarce resources of the type utilized in peacetime to turn out economic goods. Indeed, many of these resource units are identical: in the year preceding war they go into finished consumer goods or contribute to the accumulation of peace type capital equipment; and in the years of war are diverted to the production of munitions, war construction, or service in the armed conflict proper. Why then, without worrying about what ends war production is meant to serve, not measure it as a component of national product—as input of resources whose capacity to contribute to *any* accepted purpose is beyond question?

The difficulty is that this position itself already attributes meaning to war output in terms of a peacetime set of purposes. The national product it yields is total resource input, not final output. Resources, however, have meaning only in terms of the set (no matter how diverse) of products the resources are assumed eventually to enter (or produce). To treat war output as the embodiment of resources known to be productive because they are identical with or similar to resources used before the war to turn out final products is to assume that they retain their peacetime meaning, and implicitly to consider war output as a final product equivalent to the products the resources in question enter in peacetime. If such an assumption is made, it had better be explicit and contrasted to the three assumptions suggested at the beginning of this section.

2 War Output as Capital Formation

Estimates of peacetime national product assume that economic activity is to produce goods to satisfy ultimate consumers; that production is for man, not man for production. Accordingly, the distinction between net and gross is clear. Indeed, the fact that provision of consumer goods is viewed as the purpose of economic activity is revealed in the difference between the treatment of the flow of consumer and of capital goods. Because to satisfy consumers is the primary purpose, net national product includes the *gross* value of consumer goods flowing to individuals and households; and because capital goods are subsidiary to this purpose, net national product includes only *net* additions to their stock since net increments alone can augment the future supply of consumer goods.

Given consumer satisfaction as the primary purpose, war production may be treated as an item similar to capital formation in that it serves either to maintain or increase the flow of consumer goods in the future. When intended for defense, war production may be viewed as similar to other capital investment designed to avoid or mitigate the effects of calamities that threaten the productive fabric of the country (flood control, etc.). In a successful aggressor nation, war production, even if designed directly to augment its power, might conceivably lead to an increase in the prospective flow of consumer goods, and may also be treated as a species of capital investment.

If consumer satisfaction is the primary purpose, net national product should include, as in the case of capital formation of a peace type, only such unexpended part of total war output as is a net addition to the inventory of war goods. In statistical practice this means subtracting from the gross value of war output in any given year the current consumption and obsolescence of war goods. In developing illustrative figures, two estimates of such current consumption of war goods were made.

The first assumes that the period between one major war and the next constitutes a major war cycle, and treats the cumulated total of gross war output during this cycle as having been completely consumed. If the purpose of war production is to preserve the independence of a nation, it is fully attained and the goods fully consumed in a period that begins with a threat represented by one major war and ends when another major war offers a new threat. Similarly, if we are estimating the national product of an aggressor nation in a single period of war and peace, whatever investment in war goods has been made is fully consumed, in that a new war entails a new installment of huge investments in war production.

For illustrative purposes, the cycle of World War II is dated from 1939, although it might well have been dated a few years earlier, and we assume that it will last 30 years, i.e., through 1968. We begin with a partly actual, partly hypothetical series of gross war output for this country, and convert it to constant prices. The cumulated total of war output, by definition, is the total consumption of war goods for the World War II cycle. Apportioning this total consumption equally by years, for simplicity's sake, yields an estimate of annual consumption; the difference between gross war output for each year and the average annual consumption is the net addition to the inventory of war goods (Table I 1), the item that enters net national product when war output is treated as a species of capital formation.

Under these assumptions negative capital formation on the war-goods account characterizes all years following the assumed cessation of hostilities and the prewar years in which expanding war output did not reach the average levels for the war cycle as a whole. The stock of war goods is added to only in the few years when war production reaches the pitch of an all-out effort.

If, from a longer range viewpoint, the inevitability or likelihood of major wars is admitted, one must bear in mind not only the large additions to the capital stock of national security made in years of intensive war production, but also the large drafts upon this capital in peace years when war output becomes small. National product, augmented by net additions to war inventory in years of war, is reduced by drafts on the stock of war capital in

TABLE I 1

Gross and Net War Output, World War II Cycle
Annual Consumption assumed Constant throughout
(dollar figures in billions)

	GROSS WAR OUTPUT			NET WAR OUTPUT	
	Current prices	Resource input at 1939 prices	IMPLICIT PRICE INDEX	Resource input at 1939 prices	Current prices
	(1)	(2)	(3)	(4)	(5)
1939	1.4	1.4	100	—10.2	—10.2
1940	2.8	2.5	112	—9.1	—10.2
1941	12.8	9.9	129	—1.7	—2.2
1942	50.3	34.3	147	22.7	33.4
1943	81.3	50.2	162	38.6	62.5
1944	92	56.8	162	45.2	73.2
1945	70	43	162	31.4	50.9
1946	30	19	162	7.4	12.0
1947	...	6	...	—5.6	...
.		"		"	
.		"		"	
.		"		"	
1968	...	6	...	—5.6	...
Total		349.1		0	

COLUMN

1 Actual through 1943 from *Survey of Current Business,* April 1944, p. 13, Table 10, line 4; assumed thereafter through 1946.

2 Col. 1 adjusted by a price index of resource compensation in war output (App. Table II 12) for 1939-43; 100(col. 1 ÷ col. 3) for 1944-46; assumed thereafter.

3 Actual through 1943 (Table II 3); assumed thereafter through 1946.

4 Col. 2 minus average annual consumption during the cycle: the sum of entries in col. 2 divided by the number of years in the cycle (i.e., the 30 years 1939-68).

5 (Col. 4 x col. 3) ÷ 100.

years of peace. The sole way to minimize such a drain on net national product in peacetime is to prolong the period of peace, i.e., to assume a war cycle of such length that the current *annual* consumption of war goods becomes small.

These calculations could be refined by shifting the chronological boundaries of the World War II cycle or by allowing a gradual, rather than sudden, increase in war output between the two cycles. But the conclusions would still be fundamentally the same. For the cycle as a whole, war production could not augment net national product, for the large additions in the years of a major war would be offset by substantial deductions in other years. In the short run, however, it would be positive in the years of a major war, thereby increasing national product, and negative in other years, thereby reducing it.

The second estimate of the current consumption of war goods is based on assigning different life periods to the various categories of war goods.[3] The apportionment of the gross war output postulated for the World War II cycle in Table I 2 is based on rough hypothetical ratios between perishable war goods (services of the armed forces and war agencies, expendable munitions, clothing, etc.) and durable (war plants, war installations such as barracks and air fields, and durable munitions—battleships, aircraft, guns, etc.). We assume that perishable war goods are consumed in the year in which they are produced. To durable goods produced during the war years, that is, 1939-46, we assign a ten-year life; to durable goods produced after 1946, a twenty-year life; for both, straight line depreciation is assumed.

With current consumption thus estimated as the sum of perishable war goods and a corresponding part of the accumulated total of durable war instruments, net additions to the inventory of war goods can be calculated. As in Table I 1, both the addition to the stock of war capital during the war and the deficit in the years immediately following its assumed end are large. Again for the entire war cycle, war production contributes no substantial amount

[3] This basis is much less appropriate for allocating the consumption of the total investment by a nation in peace or in aggressive ambition. But it is similar to the practice followed in private business where separate categories of capital goods, all forming a related complex, are nevertheless subject to depreciation rates based upon different life periods.

TABLE I 2

Gross and Net War Output, World War II Cycle
Consumption based on Three Life Periods
(dollar figures in billions)

	GROSS WAR OUTPUT Resource input at 1939 prices (1)	CONSUMPTION 1939 prices (2)	NET WAR OUTPUT Resource input at 1939 prices (3)	PRICE INDEX (4)	NET WAR OUTPUT Current prices (5)
1939	1.4	0.5	0.9	100	0.9
1940	2.5	1.1	1.4	112	1.6
1941	9.9	4.0	5.9	129	7.6
1942	34.3	13.7	20.6	147	30.3
1943	50.2	22.0	28.2	162	45.7
1944	56.8	27.8	29.0	162	47.0
1945	43	30.6	12.4	162	20.1
1946	19	23.9	—4.9	162	—7.9
1947	6	18.1	—12.1		
1948	6	18.2	—12.2		
1949	6	18.3	—12.3		
1950	6	18.2	—12.2		
1951	6	17.6	—11.6		
1952	6	15.3	—9.3		
1953	6	11.9	—5.9		
1954	6	8.1	—2.1		
1955	6	5.7	0.3		
1956-65 av.	6	5.3	0.7		
1966-68 av.	6	6.0	0		
Total	349.1		23.1		

COLUMN

1 Table I 1, col. 2.

2 Gross war output divided between perishable and durable by assuming the following percentages for perishable: 30 for 1939-44; 40 for 1945; 50 for 1946; and 60 for all later years. It is assumed that perishable goods are consumed in the year in which they are produced. For durable items a 10-year life is assumed for those produced in 1939-46 and a 20-year life for those produced in later years. Within the life periods straight line depreciation is assumed.

3 Col. 1 — col. 2.

4 Table I 1, col. 3.

5 (Col. 3 x col. 4) ÷ 100.

to net national product—in this case because of the short life attributed even to durable war instruments.[4]

[4] The two calculations of the consumption of war goods (Tables I 1 and 2) are illustrative, though the various assumptions as to life, postwar levels of war output,

Given estimates of net war output, we can, for the years since 1939, calculate a net national product in which war output enters as a species of capital formation, i.e., for the maintenance or increase of the flow of consumer goods, and therefore indirectly related to the long run primary purpose of economic activity (Table I 3). The estimates are confined to the years for which actual values of other components of national product were available at the time of writing.

TABLE I 3

Net National Product
War Output treated as Capital Formation
1939-1943
(billions of dollars, current prices)

	1939	*1940*	*1941*	*1942*	*1943*
1 Flow of goods to consumers	64.8	68.8	77.7	85.1	94.1
2 Nonwar capital formation, net	6.0	9.3	13.0	0.1	—6.5
3 Additions to war capital inventory					
a) Based on Table I 1	—10.2	—10.2	—2.2	33.4	62.5
b) Based on Table I 2	0.9	1.6	7.6	30.3	45.7
4 Net national product (1 + 2 + 3)					
a) Using 3a	60.6	67.9	88.5	118.6	150.1
b) Using 3b	71.7	79.7	98.3	115.5	133.3

Lines 1 & 2 from Table II 1.

Note 4 concluded:

etc., have been assigned values that seem to us realistic. A case could easily be made for other levels, and hence for different estimates. With respect to the notion of war cycles, one might argue that the contribution of one war to the security and progress of a nation is not necessarily fully exhausted by the time the next war occurs, but persists into and beyond it. If we admit this argument, the life period would have to be longer than the one assumed, and total consumption after the second war would be based on the outlays of both wars.

Likewise, in the second calculation, the life assigned to the durable parts of war output could be made much longer than the one assumed; there would then be a substantial residue of net war capital formation on war 1 account even by the time war 2 begins.

Such variations in assumptions introduce no new elements into the analysis; and it did not seem worth while to elaborate the illustrations. It may be admitted that wars do not occur with sufficient regularity and their effects are not so readily measurable as to make it easy to determine the constants needed in calculating the consumption of war goods.

Net national product consists of (a) flow of goods to consumers, (b) net nonwar capital formation, (c) net war output, i.e., net additions to the inventory of war goods. Item (c) is negligible in years like 1939 and 1940, and becomes large and positive in 1942 and 1943. Consequently, the rise in net national product is accelerated, especially between 1941 and 1943.

3 War Output as Final Product

That war output is, like nonwar capital formation, for the maintenance or increase of the flow of consumer goods is tenable in the long run, but may be challenged in the short span of a major war. When the nation is in danger, military demands are paramount and can hardly be treated as capital formation for the sake of consumers, with the usual implication this conveys of discretion as to which capital investment to make or whether to make it at all. In these periods, short as they may be, the military conflict itself dominates economic activity and war output is properly treated as a final product.

To assume that the *sole* purpose of economic activity is to provide military goods is never valid, not even for the most rigorously controlled war economy. Its logic would demand that consumer goods not needed to maintain, either directly or indirectly, resources embodied in war goods should be viewed as unproductive and hence eliminated; and, likewise, tools for the production of such superfluous commodities and services. With the exception of short periods of a 'besieged fortress' condition, even when absorption in a war effort is intense, an economy never excludes or could exclude completely the demands of everyday life, i.e., of the primary purposes that guide it in the longer run.

Nevertheless we should attempt to see what national product would amount to were the provision of military goods accepted as the sole purpose. Discarding the dominant assumption underlying the customary estimates of peacetime has a marked effect on the totals. Table I 4 illustrates what happens when any goal other than to provide consumer goods is assumed dominant.

The first and chief effect is on measuring the flow of consumer goods, which become merely tools, i.e., means of keeping ultimate consumers alive as potential producers of war goods, of swelling

TABLE I 4

Value of Increases in the Gainfully Occupied and in their Efficiency 1939-1943

		1939	*1940*	*1941*	*1942*	*1943*
	A LONG TERM BASIS					
1	Increase in gainfully occupied, millions	0.7	0.7	0.7	0.7	0.7
2	Value of (1) ($ billions, 1939 prices)	6.3	6.3	6.3	6.3	6.3
3	Earnings of those gainfully occupied in 1939, allowing for increased efficiency ($ billions, 1939 prices)	70.8	71.5	72.2	72.9	73.6
4	Increase per year in (3) ($ billions, 1939 prices)	0.7	0.7	0.7	0.7	0.7
5	Total increase ($ billions, 1939 prices) (2 + 4)	7.0	7.0	7.0	7.0	7.0
6	Index of resource prices	100	104	114	136	153
7	Total increase ($ billions, current prices) (5 x 6)/100	7.0	7.3	8.0	9.5	10.7
	B SHORT TERM BASIS					
8	Income payments to individuals, 1939 resource prices (1st quarter, $ billions)	69.0	74.6	83.6	90.1	105.1
9	Increase per year ($ billions, 1939 prices)	5.6	9.0	6.5	15.0	2.9
10	Total increase ($ billions, current prices) (9 x 6)/100	5.6	9.4	7.4	20.4	4.4

LINE

1 Secular rate of additions to the gainfully occupied, based on average for 1919-38 (see Simon Kuznets, *National Income and Its Composition,* National Bureau of Economic Research, 1941, I, Table 8).

2 Line 1 multiplied by ($10,000 x $\frac{\$1,660}{\$1,839}$) or by $9,027. $10,000 is the value of net life earnings in 1923-28 prices estimated by J. M. Clark (*The Costs of the World War to the American People,* Yale University Press, 1931, pp. 217-8). $1,839 is the average payment per person engaged in 1923-28 (Kuznets, *op. cit.,* Tables 1 and 8); $1,660 is an estimate for 1939.

3 1939 entry, income payments to individuals, Department of Commerce estimate. For later years, entries are based on an annual growth of 1 per cent per gainfully occupied (slightly larger than the trend from 1909-18 to 1919-28; see *ibid.,* Table 11).

6 Table II 3.

8 For first quarter of 1939, income payments to individuals from *Survey of Current Business,* April 1944, p. 13, Table 9, line 1; extrapolated to other quarters by the movement of net national product in constant resource prices (App. Table II 12).

9 The entry for each year is the difference between its first quarter and the first quarter of the following calendar year. For 1943 the entry is the difference between its first and last quarters multiplied by 1⅓. For quarterly totals in 1939 prices see Appendix Table II 12.

their number, or of raising their productivity. Only the part of the flow of consumer goods that could be associated with the increase in the working population and its productivity, both viewed as potential contributions to war output, would be included in net national product.

A crude sample calculation for 1939-43 is given in Table I 4, in two variants. In the first, measuring the value of the secular rise in the working population and in its productivity, the long term addition to the gainfully occupied is valued at the average expected life earnings, in excess of the earner's own consumption needs; and the greater productivity of the population already working at the beginning of the period is based upon a crude secular rate per gainfully employed, total productivity being measured by income payments to individuals in constant prices.

This calculation disregards increases (or decreases) in the working population and its productivity in any single year. In the shorter term urgency of a war, it may be more appropriate to measure them, transient though they may be. For the important question is how much, during a given year, the economy has added to the gainfully occupied and to its productivity, an addition that may be available to expand war production in the few years of strain. Lines 8-10 of Table I 4 measure year-to-year increases in total 'deflated' earnings, i.e., in national product (in constant prices) attributable to producers.

If rises in the number of producers and in their productivity are net capital formation from the viewpoint of war output, so is net nonwar capital formation as ordinarily defined. Additions to stocks of commodities of various descriptions, or of claims, can be utilized to sustain a larger body of war producers in the future, if not directly for war production.

On the assumption that providing military goods is the sole purpose of economic activity, the first component of national product in order of logical priority is war output (Table I 5); in the same way as the first component in Table I 3 is the flow of goods to consumers. But total war output cannot be fully included in *net* national product, for not all items in it are finished goods from the standpoint of use in war. Munitions plants and construction units not in the theater of operations are in the nature of capital

goods, and only net additions to them are to be included; hence the crude adjustments in passing from line 1 to line 3.[5]

TABLE I 5

Net National Product, on the Assumption of Provision of War Goods as the Sole Purpose, 1939-1943
(billions of dollars, current prices)

	1939	*1940*	*1941*	*1942*	*1943*
1 Gross war output	1.4	2.8	12.8	50.3	81.3
2 Depreciation on gov.-financed war construction	Negligible		0.3	0.8	1.8
3 Net war output (1 — 2)	1.4	2.8	12.5	49.5	79.5
4 Net capital formation, nonwar	(6.0)	(9.3)	(13.0)	(0.1)	(—6.5)
5 Value of increases in gainfully occupied and in their efficiency					
a) Based on Table I 4, line 7	(7.0)	(7.3)	(8.0)	(9.5)	(10.7)
b) Based on Table I 4, line 10	(5.6)	(9.4)	(7.4)	(20.4)	(4.4)
6 Net national product					
a) 3 + 4 + 5a	14.4	19.4	33.5	59.1	83.7
b) 3 + 4 + 5b	13.0	21.5	32.9	70.0	77.4

Lines 1-4 from Appendix Table II 11.

Parentheses in lines 4 and 5 signify that from the viewpoint of war use, the figures are to be adjusted by coefficients of unknown value. Lines 3, 4, and 5 are added (line 6) on the assumption that these coefficients equal 1 in all cases in all years.

The values customarily attached to net nonwar capital formation and net additions to the gainfully occupied and to its efficiency may not be the same as those that would be used were the goods included judged in terms of relevance to war production. What the adjustment coefficients, symbolized by the parentheses in lines 4 and 5, are, we do not know; but most probably they would be less than 1. The addition of the three components to a single national product total in Table I 5 is, therefore, quite arbitrary.

Yet the chief differences between this total and that in Table I 3 would remain regardless of any likely modifications of entries in Table I 5. In all years the national product totals in Table I 5

[5] One could draw the distinction even finer, and consider as finished only such war goods as reach the theaters of active combat (just as in consumers' outlay, in the customary approach, we measure finished goods when they enter the household). But it cannot be carried through statistically with the data commonly available.

would be smaller than in Table I 3, particularly before war output assumed its present dimensions. Also, in any transition from expenditures for defense alone to those for waging a major war, a national product total defined as in Table I 5 would rise much more relatively than the national product total in Table I 3 based, as it is, upon accepting the provision of consumer goods as the dominant goal of economic activity.

4 Assumption of Two End Purposes

For the transient period of a major war we might recognize two purposes coequal in primacy: provision of goods to consumers and for war use. The division of resources between the two would be arbitrary in that it would not be determined by a recognized and clear-cut principle within the framework of economic institutions. Were there such a principle (e.g., like that which establishes a relation between consumer goods and the capital equipment that produces them), it would so relate the two purposes as to indicate either the dominance of one or the subordinate position of both to some superior goal. That no such principle governs war and nonwar output seems fairly evident. While the proportion of resources to be devoted to a war is fixed by the urgencies of the military conflict up to a certain point, it is still a matter of choice, determined by conflicting pressures, political decisions, and judgments that attempt to arrive at a consensus by trial and error.

The assumption of two primary goals in wartime bears directly upon the statistical treatment of national product. Two categories of final products are measured at their gross value: goods flowing to individuals and households as ultimate consumers and goods flowing into the military conflict. Instead of one category of capital goods net additions to whose stock are included, the dichotomy of purposes means also a dichotomy in net additions to stocks of capital goods: nonwar and war net capital formation. There should, therefore, be at least four major product categories in a national product based on this assumption. In statistical practice, however, the flow of final war goods and war capital formation are lumped together in total war output (Table 1 6, Part A).

In Part B of Table I 6 national product is the sum of income

TABLE I 6

Net National Product, on the Assumption of Two Purposes: To Provide Goods for Consumers and for the Military Conflict 1939-1943

(billions of dollars, current prices)

	1939	1940	1941	1942	1943
A FINAL PRODUCTS APPROACH					
1 Flow of goods to consumers	64.8	68.8	77.7	85.1	94.1
2 Net nonwar capital formation	6.0	9.3	13.0	0.1	—6.5
3 War output (excl. depreciation on war construction)	1.4	2.8	12.5	49.5	79.5
4 Net national product (1 + 2 + 3)	72.2	80.9	103.2	134.7	167.1
B PAYMENTS-SAVINGS APPROACH					
5 Income payments to individuals	70.8	76.2	92.7	116.6	142.3
6 Excess of contributions to social security over transfer payments	—0.4	—0.5	0.1	0.5	0.6
7 Net corporate savings, adj.	1.5	3.0	2.9	4.2	6.3
8 Additions to corporate income & profits taxes	0	0.3	1.6	6.0	11.2
9 Net business tax accruals	0.3	1.3	4.8	4.6	2.8
10 Depreciation on war construction	0	0	0.3	0.8	1.8
11 Adjustments for discrepancies	0	—0.4	—1.7	—0.6	1.2
12 Net national product (5 + 6 + 7 + 8 + 9 — 10 + 11)	72.2	79.9	100.1	130.5	162.6

LINE

1 & 2 Table I 3.

3 Table I 5.

5 *Survey of Current Business,* April 1944, p. 14, Table 12, line 5.

6 *Ibid.,* p. 13, Table 12, lines 2 and 4.

7 Adjusted for addition to 'other' business reserves, capital outlays charged to current expenses, and inventory revaluation (see *ibid.,* p. 13, Table 11, line 11, and p. 14, Table 13, lines 4, 5, and 6).

8 & 9 *Ibid.,* p. 10, Table B, line 2, and p. 11, Table 6, line 3.

10 Table I 5.

11 *Survey,* April 1944, p. 14, Table 13, line 7.

payments and savings.[6] In general, the gross value of war output

[6] National product as defined in either Section 2 or 3 cannot be estimated in this way, because the institutionally determined categories of income payments, business savings, and taxes do not (and cannot be made to) distinguish such items as consumption of war goods or ultimate consumption needed to sustain a constant body of producers at constant productivity. Even for the concept of national product in this section, the payment-savings approach cannot be used consistently as evidenced by the balancing adjustment needed to take account of depreciation on war construction (a relatively minor item).

must equal: (a) such part of the income payments to individuals as is not expended on the flow of consumer goods or on nonwar capital formation; (b) such part of net corporate savings (including additions to all reserve and accrual accounts) as is not expended on nonwar capital formation; (c) such part of business taxes as is not borne by income payments to individuals or expended for government services to business enterprises. In other words, the sum of the gross value of the flow of goods to consumers, net nonwar capital formation, and the gross value of war output should equal income payments to individuals, net corporate savings (as defined above), and such nonshiftable business taxes as go to pay for war output. The difficulty is in establishing the third item. However, it is reasonable to assume that corporate income and profits taxes, unlike other business taxes, are not shiftable to individuals' incomes; and that the increase in such taxes during a war is due primarily to the larger demands for funds occasioned by the expansion of war output. Accordingly, in line 8 of Table I 6, the increase in corporate income and profits taxes measures the part that may be assumed to finance *net* war output, and is adjusted for depreciation on war construction. The agreement between the two net national product totals is close (cf. lines 4 and 12).[7]

Obviously, national product totals based on the assumption of two goals must be larger than those based on one. If we accept a certain use for economic goods as a goal we must include their *full* value in national product; consequently, the more goals the more product categories included at their full gross value, and the larger the resulting total. The national product totals in Table I 6 are larger than those in Table I 3 by the amount of consumption deducted in Table I 3 to get net additions to stocks of war goods; larger than those in Table I 5 by the amount of the consumption of consumer goods allowed for in calculating the net accretion to the gainfully occupied and to its efficiency. Obviously were there a third purpose, *net* national product totals would be even larger than those in Table I 6.

[7] It is spurious in that the estimate of the flow of goods to consumers (line 1) is not independent of that of income payments to individuals (line 5). But an independent measure of the flow of goods to consumers, based on production and distribution data for the flow of final products, yields estimates that, while larger than those in line 1, would entail only minor (less than 5%) changes in national product.

5 Net and Gross

In a net national product total 'netness' does not mean that for all categories net additions are measured over and above current consumption. On the contrary, the chief and largest component is ordinarily the gross value of products flowing into such consumption as is considered the goal of economic activity; e.g., the full value of goods flowing to ultimate consumers. The distinction between net and gross national product is not, therefore, that the former allows for all consumption whereas the latter is gross of it in one or all categories. It is rather that gross national product is gross of consumption in some product categories that in net national product are measured net of such consumption because the goods are indirectly rather than directly for ultimate use.

Why is it useful to treat the output of such subsidiary goods on a gross basis, when only net additions to their stocks contribute to the goal of economic activity? Why, e.g., should we measure national product gross of the current consumption of durable capital, as is the practice in estimating peacetime gross national product?

Two reasons have customarily been adduced. The first rests on statistical expediency. Since to estimate accurately the current consumption of durable capital is difficult, and even the best estimate is subject to a wide margin of error, it is thought expedient to provide at least a total unaffected by the deduction of the statistically doubtful item, consumption of durable capital. This reason in itself is patently unacceptable. Were it the sole consideration, gross national product should be viewed as a statistical approximation to net national product, and, obviously, it would be a poor approximation. Some adjustment for current consumption is preferable, for it yields a smaller error than no adjustment.

But gross national product estimated according to peacetime definitions has a genuine *raison d'être*. For since in the short run, the economic life of durable capital is largely a matter of judgment, what constitutes a replacement of or an addition to durable capital is, for relatively brief periods, up to each entrepreneur. Thus, the very circumstance that makes estimating the current consumption of durable capital for a short period statistically hazardous makes entrepreneurial decisions to order production of such capital in the short run better understood when output is measured gross instead

of net. Also, any relations between the flow of goods to consumers and capital formation that affect, in the short run, the composition of national product and perhaps the very changes in it, are, therefore, more apparent when capital formation (and hence national product) is measured gross of the current consumption of durable capital.[8]

This statement suggests the nature of the differences between net and gross national product concepts. The former, appraisals of the net contribution of economic activity to definite purposes, tend to disregard the fact that, in the short run, it may not be the net expected contribution that guides economic decisions. In the areas where economic activity or policy is geared in the short run to gross output, not to the net contribution to specific goals, net national product is modified into a gross national product concept. Net national product, based on continuously held goals, is both a short and a long term concept, although the difficulties inherent in measuring certain types of consumption for short periods carry over into measuring short term changes in net national product. Gross national product, by taking into account the fundamental economic mechanisms in their shorter range functioning, is essentially a short term concept. A long series of net national product totals has meaning as a set of cumulative and comparable figures. A long series of gross national product totals has meaning only as a string of figures for short term periods. In the longer run, consumption of durable capital must be deducted, since capital is physically destroyed or becomes obsolete beyond the point of any possible use. In the shorter run, it may be disregarded, since the shorter term choices, not being compelled by physical attrition or technical obsolescence, are better understood in terms of gross than of net capital formation. Differences among various concepts of *net* national product are reducible to differences in the goals with reference to which net contribution is measured, and in the ways the line is drawn between economic and noneconomic activities. Differences among various concepts of *gross* national product are, furthermore, determined by the category of products (and of corresponding activity) that are measured on a net addi-

[8] A similar argument applies to decisions of government as an entrepreneur with reference to the construction of war plants or housing. The reason for measuring national product gross of consumption of nonwar private durable capital is valid also for measuring it gross of consumption of public durable capital, war or nonwar.

tion basis in net national product, but are measured gross in gross national product (e.g., durable capital, government expenditures, or war production).

This distinction has direct bearing on the treatment of war output in estimating national product. So far as we study national product in the longer range, and view developments during a major war against this broader canvas, we gain nothing by using gross national product concepts. Only when we study wartime as a short term period do they become relevant. But even for such short terms the net national product concept of Section 3, based on providing military goods as the sole purpose of economic activity, has too little validity to warrant discussion. We devote ourselves to the concepts explained and illustrated statistically in Sections 2 and 4.

First, we consider treating durable capital on a gross rather than net basis. Whatever factors justify such treatment in peacetime would naturally affect years like 1939 through 1941, before war became a dominant drive in the country's economic activity. But even from the viewpoint of relevance to war needs, one may prefer to measure the *total* output of durable capital, i.e., not deduct current consumption. It is this total that measures the use of resources important in the war economy; and current consumption of durable capital is an unknown quantity in years of strain when all facilities, no matter how obsolete, are pressed into service. Therefore, for purposes of short term analysis, we measure national product gross of the consumption of durable capital in calculating both variants in Table I 7 (Part A, col. 2 and 3, and Part B, lines 5 and 6).

We next consider whether it is not also better in the shorter term run of a war to include the full value of all war output. The justification would not be that the provision of goods for the military conflict is an independent goal (as in Sec. 4). It would be rather that, given the long term meaning of war production as a capital cost, in the shorter run of a war social decisions are made with an eye to total war output; that economic activity is harnessed to programs that call for gross war output, not for net accretions to inventories of war goods. The reason is analogous to that for modifying net national product into a total gross of the consumption of durable capital; namely, in order to express it in the terms in which the immediate drives of economic activity are conceived.

TABLE I 7

Net and Gross National Product, the Several Variants Summarized

A Outline of Composition

NET NATIONAL PRODUCT (1)	ADD TO YIELD COL. 3 (2)	GROSS NATIONAL PRODUCT (Gross of durable capital consumption) (3)	ADD TO YIELD COL. 5 (4)	TOTALS GROSS OF DURABLE CAPITAL AND OF WAR GOODS CONSUMPTION (5)
1 Peacetime Concept (war output as capital formation)				
Flow of goods to consumers		Flow of goods to consumers		Flow of goods to consumers
Net nonwar capital formation	Consumption of nonwar durable capital	Gross nonwar capital formation		Gross nonwar capital formation
Net additions to inventory of war goods & to war construction	Consumption of war construction	Net additions to inventory of war goods & gross additions to war construction	Consumption of war goods	Gross war output
2 Wartime Concept (two end purposes)				
Flow of goods to consumers		Flow of goods to consumers		Flow of goods to consumers
Net nonwar capital formation	Consumption of nonwar durable capital	Gross nonwar capital formation		Gross nonwar capital formation
Net war output	Consumption of war construction	Gross war output		Gross war output

B Approximate Totals, 1939-1943

(billions of dollars, current prices)

	1939	*1940*	*1941*	*1942*	*1943*
Net National Product					
1 Variant 1, war output as capital formation	71.7	79.7	98.3	115.5	133.3
2 Variant 2, two end purposes	72.2	80.9	103.2	134.7	167.1
Consumption Items					
3 Consumption of durable capital, nonwar	7.2	7.4	7.9	8.7	9.2
4 Consumption of war construction	negligible		0.3	0.8	1.8
Gross National Product (gross of consumption of durable capital)					
5 Variant 1 (1 + 3 + 4)	78.9	87.1	106.5	125.0	144.3
6 Variant 2 (2 + 3 + 4)	79.4	88.3	111.4	144.2	178.1
Totals Gross of Consumption of Durable Capital and of All War Goods					
7 Variant 1	79.4	88.3	111.4	144.2	178.1
8 Variant 2 (same as 6)	79.4	88.3	111.4	144.2	178.1

Line 1: Table I 3, line 4b; 2: Table I 6, line 4; 3 and 4: Table II 11; 7: sum of lines 1, 3, and consumption of war output (Table I 1, col. 1, minus Table I 2, col. 5).

As is inevitable, this total is identical with gross national product when two purposes are assumed and current consumption of durable capital is not deducted (Table I 7, Part A 1, col. 5, and Part A 2, col. 3, and Part B, lines 7 and 8). In the first, consumption of war goods is recognized in long term net analysis but disregarded in short term gross. In the second, the shorter term changes of war years are reflected in the very choice of goals; and hence the consumption of war goods would be disregarded even were the two purpose concept applied to a long period.

6 Summary

For the uses estimates of national product serve, two interpretations of war production from the viewpoint of the purposes of economic activity seem preferable.

a) For short term studies a national product total that includes the full value of the flow of goods to consumers, gross nonwar capital formation, and the full value of war output seems most useful. The distinction between such wartime *gross* national product and *net* could be drawn along lines similar to those of peacetime, in that the latter would exclude the current consumption of durable capital (nonwar construction and equipment and war construction and industrial equipment). In other words, net national product would include the flow of goods to consumers, net nonwar capital formation, and war output net of the current consumption of war construction (see Table I 7, Part A 2, col. 1 and 3).

The wartime totals defined above differ from peacetime totals in that they include the value of war goods consumed. This difference is attributable to the assumption, for the short period associated with a major war, that economic activity has two purposes: provision of goods to consumers and for the armed conflict.

As indicated in Section 5, this wartime national product, gross of the consumption of durable capital, is statistically identical with a total computed by modifying the net national product concept of peacetime into a total gross of the consumption of both durable capital and *war goods* (see Table I 7, Part A 1, col. 5). The reason we consider it preferable to make the provision of goods for war a second purpose of economic activity and accordingly formulate wartime national product totals different from peacetime, on

both a net and gross basis, stems from the need to emphasize the change a major war brings in the drives of economic activity. Even in a country that in peacetime devotes a substantial portion of its resources to war production, imminence of a major war entails a drastic reorientation of economic activity; and for the period associated with active participation, even the *net* contribution of economic activity cannot be judged solely from the viewpoint of providing goods to consumers or of any ultimate purpose other than that of helping the armed conflict. This break between peace and war years is even sharper in a country such as this, of whose resources only a minute proportion goes into war production in peacetime. To retain in a study of war years a net national product concept geared to the longer term dominance of pacific goals, and to take account of the war as a guiding purpose merely by coining a special gross product concept would leave the investigator open to the risk of minimizing the redirection of economic activity that occurs; and would yield net national product totals of small usefulness for such a short term study. To assure recognition of the cleavage in goals that occurs between peace- and wartime it seems better to admit the effect of a major war upon the very goals of economic activity in the short run, and give both net and gross national product wartime definitions.

b) For longer term studies net national product alone is relevant; and for it the treatment of war output as a species of capital formation seems to be the sole appropriate approach. Once our assumption that the purpose of economic activity is to provide goods to consumers is accepted, war output can have meaning only as capital formation designed to maintain or increase the flow within an institutional framework that does not preclude war as an instrument of national policy.

If war output is interpreted in this way, the difference between the resulting estimates of net national product and national income as estimated in this country in the past depends upon which method of measuring income originating in government activity and the consumption of war goods (see Sec. 2) is chosen. If income originating in government is measured on a payment basis, i.e., net government savings are taken into account, the implied calculation of additions to government assets (to be used as an offset against an increase in government debt) should include also additions to the

inventory of war goods. If it is measured on a cost basis, national product should be adjusted to take account of net investment or disinvestment on war account.

In both treatments of income originating in government activity, the effect of the adjustment for the consumption of war goods will be marked only during a major war and the years immediately following, for only then will the stock of war goods subject to depreciation be large. In other years the adjustment for net investment or disinvestment on war account can be merely a minor fraction of net national product.

In conclusion, we stress the dependence of the concept and the estimates upon the definition of the purpose of economic activity. National product cannot be measured for the years of a major war as it is in peacetime because the customary long run assumptions concerning the goals of economic activity are not basic. Is provision of goods to ultimate consumers in fact the sole purpose that guides and should be used to evaluate economic activity? When the very life of a social system is at stake the everyday purposes of economic activity are overshadowed. Yet since from the *longer run* viewpoint they are dominant, we retain the peacetime goal—provision of goods to consumers.

This goal is not always dominant. In other countries, in other times, even from a long term viewpoint, provision of goods to consumers may not be or have been the sole purpose of economic activity. For example, where the basic consideration in the longer run—three or four decades—is to build up capital in order to hasten industrialization and come abreast of more advanced countries, a longer term goal is perhaps better defined as to provide goods for capital accumulation; then the net contribution of economic activity should be measured in terms of net capital formation as ordinarily defined plus additions to the productive population and to its efficiency. Still other countries may well reach a stage when the maximization of economic goods for the benefit of ultimate consumers is not the dominant goal, unless under economic goods we include leisure or participation in activities which we may put under the heading of the fine arts. At this later stage the full economic potential may perhaps not be exploited to provide goods to consumers; and economic activity proper may be reduced

to afford more opportunity for noneconomic pursuits. Under such conditions the net contribution of economic activity would be measured in terms of the net balance of consumer goods over their cost, the latter treated as a draft on such desirable ends as greater leisure for noneconomic pursuits.

From many viewpoints, the provision of goods to consumers is a subsidiary rather than a primary aim of economic activity. If the functioning of the economic system is judged by its contribution to social welfare at large, if some idea of a good life is the touchstone, then both provision of goods to consumers and any other immediate purpose of economic activity will be subordinate, and the entire calculation of national product, if calculation is still possible, will be different. No longer an economic concept, national product will become a concept within a broader frame of reference. If the social philosophy of recent years, which minimizes the system of values inherent in economic institutions and tends to subordinate it to some idea of a good life, of national glory, or of some other nebulous criterion deemed superior, is adopted, the net contribution of economic activity will have to be measured on the basis of the new and extra-economic goals. The customary measures of national product assume not only the end purposes that guide economic activity but also that they are within the economic framework proper and are independent of goals that, however superior, are not reflected in economic institutions in their day to day operation.

APPENDIX I

Comparison with Department of Commerce Concepts

The wartime concepts of net and gross national product defined in the text (Table I 7, Part A 2) differ not only from the longer term peacetime concepts, but also from those currently used by the Department of Commerce. As estimated by the Department of Commerce, national income is the sum of income payments (including savings of individual entrepreneurs) and of undistributed corporate profits net of taxes, i.e., it is defined statistically as it was in peacetime. But whereas in peacetime a total so measured closely approximates net national product—the value of all final goods and of additions to the stock of capital (fixed, working, and claims against foreign countries)—

it does not in wartime. Besides the flow of consumer goods and additions to stocks of capital goods of the usual type, it includes a substantial portion, but only a portion, of war output (specifically, that financed out of direct personal taxes, individuals' savings, and corporate savings). Consequently, whatever significance can still be attributed to it as an estimate of the flow of the means of payments to individuals and accretions to freely disposable funds of corporations,[9] it is no longer net national product.

We have defined the latter for wartime as the sum of the flow of goods to consumers, net nonwar capital formation, and war output net of depreciation on war construction. On a payment level, this total would be approximated by adding to income payments and undistributed corporate profits (net of depreciation and taxes) the increase in corporate taxes and tax accruals (adjusted for depreciation on war construction, see Table I 6). The latter is the amount by which net national product, as defined by us, exceeds national income as currently measured by the Department.

'Gross national product at market prices' rather than national income is the concept the Department of Commerce uses as a comprehensive total of which war output could properly be treated as a component. On the product level, it is the sum of the flow of goods to consumers (excluding direct government services), private gross capital formation, and all goods flowing to government (government expenditures on goods and services). On the payments-savings level, it equals national income plus all business taxes.[10]

Two arguments are adduced by the Department in explaining its introduction of 'gross national product at market prices'. The first is the need for a total that would yield a correct estimate of consumers' outlay after 'war expenditures and any other nonconsumer

[9] If the main purpose is to gauge the flow of disposable funds to individuals and corporations, one may argue that a more suitable total would be of income payments to individuals net of direct personal taxes, plus undistributed corporate profits net of *all* taxes.

[10] This description disregards the adjustments made by the Department in estimating corporate profits, since they would be proper also to a peacetime concept of gross national product.

For a discussion of the concept and the reasons for its adoption, see Milton Gilbert: 'Measuring National Income as Affected by the War', *Journal of the American Statistical Association,* June 1942, pp. 186-98; also the several articles presenting the estimates in various issues of the *Survey of Current Business* since 1942, especially the first, in the March 1942 issue.

spending' have been deducted. The second is that the total covers all finished products at market prices rather than at factor cost.

Both arguments would be as valid for our wartime concepts of national product. If subtraction of *war* expenditures and other nonconsumer purchasing (i.e., presumably nonwar capital formation) is to leave a residual that properly measures consumers' outlay, then the total should be a sum of consumers' outlay, capital formation, and *war* expenditures (gross or net of depreciation on war construction). But, in general, this 'subtraction' argument is not relevant unless it indicates the reason why a given type of outlay is to be treated as a subtrahend from a comprehensively defined minuend of national product. If the reason is that war output measures *final* products, and should, therefore, be included in national product in the same way as the flow of consumer goods is, then the total would be estimated as described in the text. It would have to include all government outlays only on the implicit assumption that all are for final products.[11]

The second argument, which contrasts measurement at factor cost and at market prices, is relevant only if government outlays are to be kept as a separate category of national product. If, however, we are free to allocate national product by categories, either the peacetime or the wartime concepts defined in the text can be interpreted as totals in market prices. For example, net national product in peacetime is the sum of (a) flow of goods to consumers at market prices; (b) private net capital formation at market prices; (c) public net capital formation at market or cost prices. And, both net and gross national product, wartime concept, are sums of (a) flow of goods to consumers; (b) nonwar capital formation, private and public; (c) goods purchased by government for war purposes, all at market prices. The Department's gross national product differs from other totals only in that it includes the entire government outlay on goods at market prices; the other totals include only the portion not already covered under the market values of products of the private business system. The crucial difference is in the treatment of *all* government activity as a congeries of final products; not in the evaluation at market price rather than factor cost.

This is not to be taken as implying that gross national product, as defined by the Department, does not have its uses and a mean-

[11] Or for a different theoretical reason discussed below.

ing. Providing the main argument for it, they lie in the implicit assumption of government outlay as an independent variable that can be modified directly by public policy. This independent variable is then conceived to be of telling effect on national product as a dependent variable.[12]

Such an assumption is inherent in the general line of reasoning that leads to estimating national product gross as well as net. When theoretical or empirical considerations require the assumption that changes in the total product of the economic system or alternative policy steps are better understood if a given activity is measured gross rather than net, there is argument for measuring it gross and for making national product correspondingly gross. What is in the part must also be in the whole.

The difficulty in defining a comprehensive gross national product total is that its size depends upon the character of the industrial classification: the more industrial divisions distinguished the larger it would be because of the greater duplication caused by repeated counting of products of one industry consumed by another. In this sense, there is no such thing as a uniquely determined gross national product.

This difficulty may be avoided by a second approach. To make the part and the whole comparable, we can, upon treating all government outlay on goods and services as if it were for finished goods, include it fully with the two other chief components of finished output—consumer goods flowing to households and individuals (excluding government services) and private gross capital formation. This is the gross national product total of the Department of Commerce. It is measured gross with respect to activities in two areas: private capital formation and government activities of all descriptions. The distinctive feature lies in treating government activity on a gross basis.

Were we for some reason to consider the activity of the steel industry, rather than of government, paramount in determining national product or policy, national product would be measured gross of the consumption of (a) durable capital outside the steel industry; (b)

[12] Presumably not directly, but indirectly, in the way government expenditures are financed, and hence modified to measure income-creating activities of the government. However, at the first stage of analysis, *all* government outlays, and a national product total that would include them fully, must be considered.

the steel industry's product, i.e., the part of the industry's purchases of commodities and services that is covered in the value of consumers' outlay and in gross capital formation outside the steel industry. In other words, we measure gross only the contribution of the particular industry whose total outlay is considered a proper measure of its activity. The meaning of such a gross national product obviously depends upon the propriety of emphasizing the gross value of a given industry's activity, and accordingly of treating it as if it were for finished products. In the case of government activity, the meaning depends upon the validity of an assumption that, in essence, makes government outlay an important independent variable in determining the total product of the nation.[13]

If the above argument is valid, two further comments are in order. First, so far as the assumption concerning the importance of government outlay is valid for postwar years, gross national product, as defined by the Department of Commerce, will continue to be useful. It is not a purely wartime concept but rather one inherent in a certain view of the role of government activity.

Second, like all gross totals, it does not measure the *net* contribution of economic activity properly. Before it can tell us what economic activity contributes to the satisfaction of the ends society pursues it must be freed from the duplication that, by definition, it contains. Useful as it may be as a step in an analysis that may serve to relate public policy and net economic output, it is only an intermediate step that must be followed by others before the ultimate effects of public policy can be assayed.

[13] This and the preceding two paragraphs follow closely the author's discussion in 'Taxes and National Income', *Proceedings of the American Philosophical Society*, Feb. 1944.