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ECONOMIC INDICATORS IN ECONOMIC ANALYSIS

14 September 1951

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Publication No. 152-17

INDUSTRIAL COLLEGE OF THE ARMED FORCES

Washington, D. C.

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Dr. Louis J. Paradiso, Chief Statistician, Office of Business Economics, Department of Commerce, was born in San Ferdinando, Italy, on 10 December 1902. He received his B.S. degree from Rutgers University, 1925; M.A. from Ohio State University, 1926; and his Ph.D. degree from Cornell University in 1932. From 1934-1936, he was with the National Recovery Administration as statistician; 1936-1940, National Resources Committee, statistician; 1940-1947, Department of Commerce, Bureau of Foreign and Domestic Commerce, Chief, Business Structure Division; 1947-1949, Econometric Institute, Inc., director of research and vice-president. His present position is Chief Statistician, Office of Business Economics, Department of Commerce. During World War II, a considerable part of his work related to providing information and analyses to such war agencies as OPA and WPB. He is the author of the following books: "Patterns of Resource Use," National Resources Committee, 1938; "The Structure of the American Economy," coauthor, 1939; "Capital Equipment Requirements of the Iron and Steel Industry," National Resources Committee, 1940. He has contributed numerous articles to the "Journal of the American Statistical Association," "Econometric Society," "Survey of Current Business" and other publications.

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ECONOMIC INDICATORS IN ECONOMIC ANALYSIS

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COLONEL BARNES: Some of you have had the experience already in your past assignments with the use of economic indicators. Others may not have had this experience, but in your work here and in your probable future assignments you will have more and more need for an understanding of the basic charts and tables used by the Government to present the current and future trend of the national economy. Our speaker this morning, Dr. Louis J. Paradiso, is the Chief Statistician of the Office of Business Economics in the Department of Commerce. One of the jobs his office has to do is to analyze the economic position of the country. This applies not only to current appraisals, but includes evaluation of the future outlook. Dr. Paradiso is going to explain to you this morning the specific usefulness of different economic indicators, the different types in use and their application to economic mobilization. It is a great pleasure to introduce Dr. Paradiso to this audience.

DR. PARADISO: There are many types of economic indicators which are used not only in general economic analyses, but are also used by businessmen as guides to their policies and in their sales efforts. I am going to concentrate on a relatively few significant ones which are used very widely to appraise business conditions through all periods of the economic cycle.

There are five groups of business indicators most used in economic analyses. These are (1) production indicators, (2) employment, (3) purchasing power and consumption, (4) prices and monetary indicators, and (5) a group which is used primarily for getting some idea of the short-term outlook for the economy. I class this latter as the group of anticipatory statistics. I will define these later on. They constitute a very important set of statistics which have been recently developed in analyzing the prospects or outlook for the economy.

Let us start with the production indicators. There are three basic production indicators widely used in economic analysis and, by the way, when I say "economic analysis" I also mean the studies made by businessmen to gauge their efforts in relation to the total economy. The first is the gross national product. I am assuming that you had had some discussion of this measure previously, so that I will simply define the gross national product as a measure of the total value of final products at market prices. So the gross national product is essentially a measure of total production; but total production which does not include directly such raw materials

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or intermediate products as steel or raw cotton, but of the final products such as trucks and machinery, and all types of consumer items, such as food, clothing, and rent. This production measure is in market prices, which means it is valued in terms of the actual price paid by the purchasers of the product. When you buy a pack of cigarettes, for example, and pay 20 cents a pack, that is the value that enters into the gross national product. In other words, the value of product includes excise taxes as well as the cost price of cigarettes. We have recently made an adjustment to gross national product for price changes so as to be able to derive some measure of physical output. This is called the deflated gross national product. This series is available from 1929 through 1950. I will discuss it a little later.

The next measure of total production is the national income. You may not have thought of national income as a measure of total production; actually, it is. It measures total output in terms of factor costs; in terms of wages and salaries, dividends, interest payments, and so on.

The third measure is industrial production. This measure is limited to manufacturing and mining output. It is a series published by the Federal Reserve Board. This series is available in a detailed breakdown of industries such as the iron and steel industry, machinery industry, food products industry, and so on. The series on industrial production attempts to measure output in a somewhat different way from that in which the gross national product attempts to measure total production. The attempt by the Federal Reserve Board is to measure total industrial production or physical quantities--the production of steel ingots, to represent steel products, the output of shoes by the number of shoes, and so on. But there are many areas in which it is not possible to obtain the physical quantity series and, as a matter of fact, it may be undesirable to use the physical quantity series. For example, in the case of the production of ships, it may take two years or so to build a ship. The production of ships should not be measured at the time they are completed; the measure should include the production all along the line, including the work in process. Thus the Federal Reserve Board, both because of its inability to obtain the physical quantity data and because of the conceptual problem of measuring production, measures the output in many cases in terms of this concept of work in process and completed, by the use of man-hours. This man-hour measure is adjusted by multiplying it by the production per man-hour, in other words, by the productivity to arrive at a production measure.

The real problem with regard to this method is that it is very difficult to obtain a measure of changes in productivity. For example: How is it possible to measure productivity changes in the

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case of the machinery industry from one month to the next? It is a very difficult problem. There is no actual production series. If there were, the Federal Reserve Board would have a substitute for the man-hours series. It is true that Census information is available to derive a measure of the trend of productivity, over a long period of years, and these trend factors are used to multiply the man-hours to arrive at production. This is a rough adjustment, since it does not catch the month-to-month changes in productivity.

Generally, the Federal Reserve Board index of production varies much more than the gross national product in real terms. I have used the expression "in real terms" because we have to compare it with the industrial production index, which is a physical index; we must use the gross national product after adjustment for price fluctuations. If the real gross national product is compared with the Federal Reserve Board index, the latter fluctuates much more widely over the business cycle than does the real gross national product. The major reason for this is that the gross national product includes the output of services in the economy, and other segments in addition to that of manufacturing and mining, which are the only two groups included in the Federal Reserve Board index. Since the output of services does not fluctuate very much over the cycles, it gives greater stability to the gross national product when compared with industrial production.

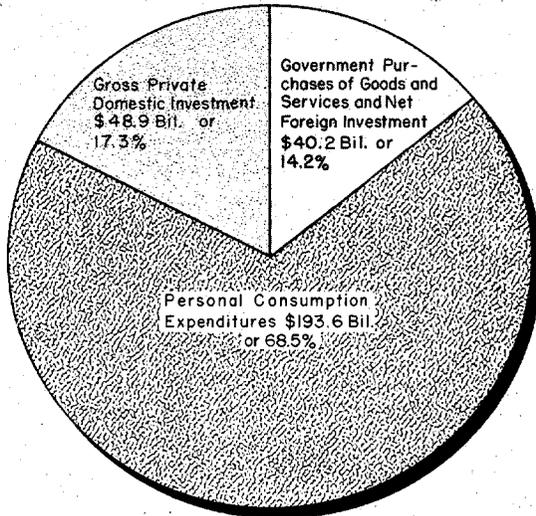
The gross national product is an extremely useful tool in economic analysis, because there is available through this measure the changes in the various types of purchases involved, that is, government purchases, purchases by business, and purchases by consumers. As a consequence it is possible to see which are the strong elements in economy and which are contributing to its weakness, and from these considerations it is possible for businessmen to alter their policies and also for the Government to take a look at its policies with a view to trying to remedy those which are not wholesome to the economy.

Thus there is a great deal of advantage in having this framework. It permits analysis of the various types of fluctuations which are occurring in the major users of the gross national product.

Chart 1, page 4, gives the breakdown of the gross national product in terms of its major components. The upper circle represents a breakdown of the gross national product in 1950 into the three major components. Roughly, the expenditures made by consumers for all types of goods and services have constituted about two-thirds of the gross national product. That is a proportion to keep in mind. These expenditures comprise by far the largest component of total national production.

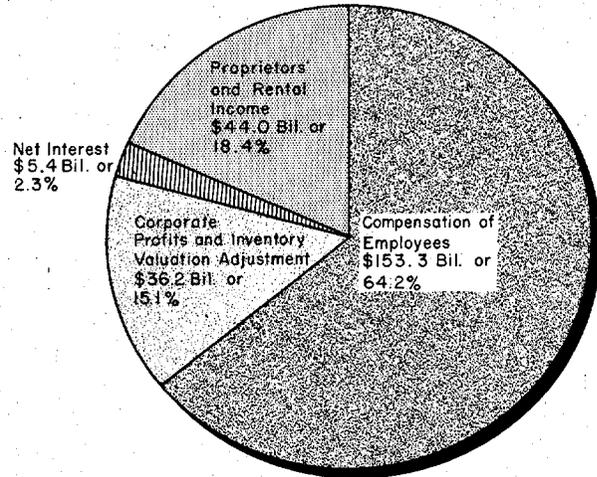
CHART 1

1950 PERCENTAGE DISTRIBUTION OF
GROSS NATIONAL PRODUCT
\$282.6 Billion



and

NATIONAL INCOME
\$239.0 Billion



One segment of this chart consists of government purchases of goods and services, and I have included in that the net foreign investment. The net foreign investment most of the time has been a fairly small item. At this time there are certain problems with regard to the foreign aid program which make it desirable to combine these two components. The component of government purchases represents about 14 percent of the total product; the remainder--which is the gross private domestic investment, consisting of the purchases by business of all types of plants and equipment, the amount of purchases of residential houses, and the changes which occur in business inventories--constitutes about 17 percent of the total gross national product.

I want to show you another chart later of various types of changes which we have in these three components, so you can see which are the dynamic ones and which ones really affect economic conditions.

The national income is an extremely useful measure for different purposes. The national income is used by both business and labor. Of course the Government is also interested in these magnitudes of business and labor incomes to see the ways in which the shares of the incomes are being distributed among wage earners, business income, corporate profits, rents, and interest payments. Many labor unions scrutinize these figures very closely to see how the workers are sharing in the total income in relation to the way business is sharing relative to the other groups in economy.

You will recall that national income represents the total amount of money earned from current production. From current production; that's the key to it; the total amount of money earned from current production by labor and business and property.

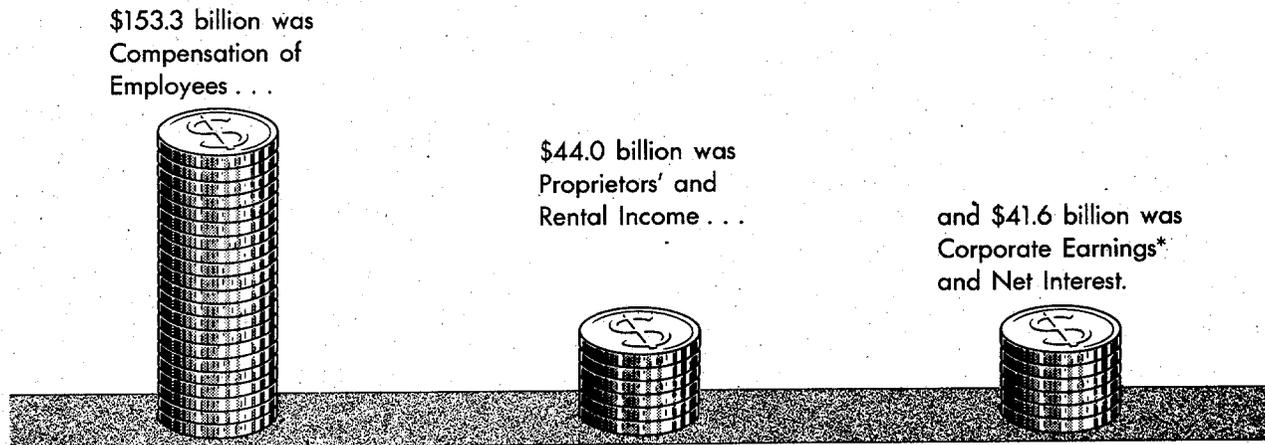
Chart 2, page 6, shows the distribution of the national income into its major components. The large segment of the chart, the compensation of employees, constitutes about 64 percent of the total national income. As a matter of fact, this proportion does not vary a great deal. So, if you think of the wages and salaries received by employees from business, farm, and government operations, they constitute roughly a little less than two-thirds of the total national income. The segment representing proprietors' and rental income includes farm and nonfarm businesses and professions. That income constitutes 18 percent of the total.

Then we have net interest, which is a fairly stable item. Net interest paid comprises 2.3 percent of total national income.

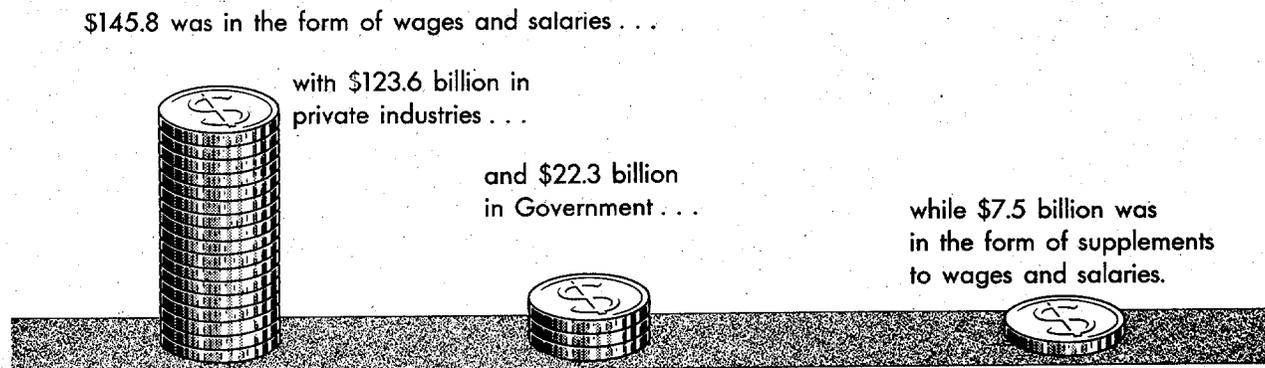
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CHART 2

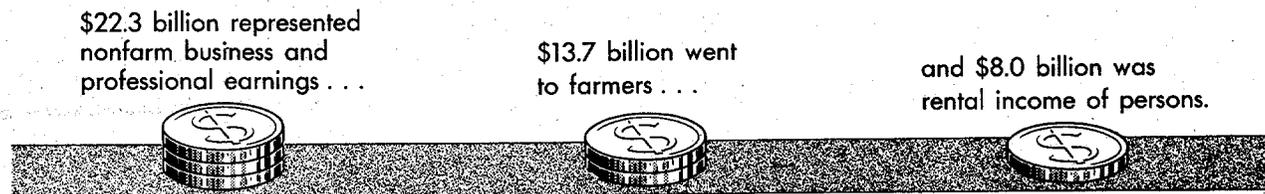
Of the NATIONAL INCOME amounting to \$239 billion in 1950 . . .



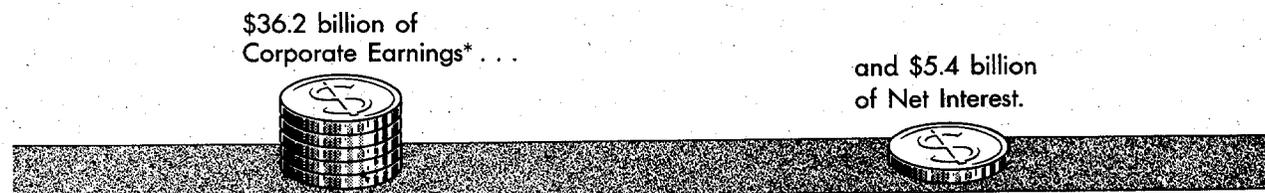
Of the COMPENSATION OF EMPLOYEES . . .



Of PROPRIETORS' AND RENTAL INCOME . . .



The REMAINDER included . . .



*Corporate Earnings represent Corporate Profits (before taxes) and Inventory Valuation Adjustment.

And, finally, the item which represents the corporate profits plus the inventory evaluation adjustment. I will not describe that particular adjustment, but you think of it pretty much in terms of profits before taxes. That represents about 15 percent of the total national income in the economy. Thus it is clear that the measure of national income is extremely useful in terms of analyzing the shares going to the various groups in the economy.

These data on national income and product are available annually from 1929 to 1950 and quarterly from 1939 to date. For many purposes it is desirable to have a longer-term series. We have made an attempt, for purposes of certain types of analyses, to carry back the data on gross national product to a period before 1929, back to say 1890. We have made such estimates but we are not releasing them because we want to have some time to refine the data.

Now, with respect to the uses of these two types of indicators by business. Many companies deal with raw materials or intermediate products. In such cases they utilize the gross national product either in total or by recombining some of the items in the analysis of their sales. Let me make that clear. For example, the Johns-Manville Corporation, dealing with various types of building products, has made very extensive analyses of the way its sales are related to the total economy. A beginning in such analysis would be to relate its sales to the gross national product. This would not give too close a correlation, because the gross national product would include items which are not directly related to the sales of its products. So, what is done is, to combine certain components of the gross national product which are more directly related to the sales of the particular firm. Thus it is possible to get a closer correlation between its sales and total construction activity and, with further refinement, even a better result by taking out or including components more relevant to its sales. By that process it is possible to analyze its sales in relation to a very large segment of total production.

We can also go a step beyond that and see how its sales are related to other companies' sales, to see whether it is losing position in relation to other companies or not.

The information which enables us to compile the gross national product and national income comes literally from thousands of sources. I can't begin to describe to you the numerous sources which are used and the various techniques which are employed in order to derive these estimates. I might mention this; that just in the last few days, the Office of Business Economics of the Department of Commerce has published the "1951 National Income Supplement," which is a much

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more extensive job than was ever done before, and which contains the sources of information used for the compilation of this material on national income and gross national product, as well as the various techniques employed in deriving the data. So, if you are interested in some of the detail, with respect to both sources and methods, I would suggest that you purchase this volume from the Superintendent of Documents.

Generally, the sources of information are of two types; that is, the regularly published sources of various government agencies, such as the Bureau of Internal Revenue, which provides information on profits, and the Social Security Board, which provides information on wages and salaries; also, the Bureau of Labor Statistics, which provides information on employment, and the Interstate Commerce Commission, which provides information on the transportation segment; and the Census Bureau, providing very important data for much of this statistical compilation. Other sources of information are based on sampling data.

We attempt to get a representative sample, and from the sample we blow up the results to cover the total economy. For example: The Office of Business Economics conducts a monthly industrial survey, in which a representative sample of manufacturing companies reports sales. These are subdivided by industries, and by blowing up the sample industry totals are obtained from the samples. Thus total sales are obtained for the food industries, for the automobile industry, and so on. So a good deal of the information which is used in this connection, particularly with the current estimation of national income by product, stems from the sampling approach.

The Federal Trade Commission and the Securities Exchange Commission, to take another example, make a survey every quarter of the financial conditions of a sample of companies from which estimates of corporate profits are derived for the current quarterly period; but, in order to get the total each year, we adjust them to the aggregate industry data of the Bureau of Internal Revenue covering the major groups of industries.

This gives you some idea of the approach which is used as to the sources. The Federal Reserve Board utilizes pretty much the same approach. It uses trade data, industry data, and government data on its production series. For example: The American Iron and Steel Institute publishes information on the production of steel ingots month by month and year by year, and the Federal Reserve Board incorporates that information in its production series. On the other hand, it also has to use sampling data in some cases. Then the series are combined with the use of data

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from the Census of Manufactures. These data provide weights which the Federal Reserve Board uses to combine these series. Shoes and steel ingots cannot be added and have the result mean anything, unless they are combined properly in terms of their economic importance. The weights used are the value added by manufacture.

Let us go on to the second set of economic indicators--employment and unemployment. From the point of view of general economic analysis, the most important data in this area are those published by the Bureau of the Census on the labor force, employment and unemployment, each month. You will find these series published regularly in Economic Indicators. These series are extremely important, because they provide a measure of the total volume of employment and unemployment which prevail in the economy. We are very much concerned with the adequacy of the labor force. We follow very closely the unemployment figures, because when unemployment gets below a certain number, say below two million, then we tend to get difficulties with respect to obtaining labor--because two million is roughly frictional unemployment. It is the unemployment which arises simply from the fact that some people move from here to there, or people get sick for a long time and they are not back at their jobs. Thus normally there are about two million persons unemployed resulting from the necessity of people moving around. When unemployment gets below that a tight labor situation may be indicated, particularly in certain skills and localities. So we watch this figure very closely. For example, in periods of decline as in the 1948 and 1949 recession, many government officials were very much concerned because unemployment was increasing from a level of about less than two million in the early part of 1948, up to close to four million sometime in the early part of 1949. The rise gave a great deal of concern since much of it was concentrated in certain industries and localities.

What I am suggesting here is, that this particular series of total labor force and the civilian employment--which is broken down into agricultural and nonagricultural unemployment--is a very useful indicator of the degree to which our labor force is being utilized by the economy. It is one that should be followed month by month.

This information on employment and unemployment of the Bureau of Census is based on a sample and, consequently, as of all samples, it has some degree of error; so when you look at the figures on unemployment, take that into account. As a matter of fact, the Bureau of the Census, in its release, provides some measure of the range of error which is involved. It is important to recognize that a small change in unemployment of, say, a couple of hundred thousand, from one month to the next, may not be significant, but if the change is fairly sizable, amounting to a half million or more, that's the time to scrutinize the figures closely as to the reasons for the rise.

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The Bureau of Labor Statistics provides employment data by major groups of industries, in fact, a detailed group of industries. If you are interested in getting the employment situation month by month for various types of industries, for example, if you are interested in looking at the employment progress in the area of ordnance or in the area of defense-supporting industries, there are enough detailed industry data for which employment data are available through the Bureau of Labor Statistics reports, so you could get some notion as to what extent the defense program is absorbing labor resources and to what extent it is diverting employment from the civilian industries.

Generally, we have found that the analysis of employment by detailed industries, such as I have described, does not give you a very much different conclusion from the point of view of changes from what you would get by analysis of corresponding production data. You can see why that is so. Employment is very closely tied to production. If analyzed in connection with the hours of work per week, and the rate of productivity changes, over short periods, the information on employment by industries is useful in gauging the shifts which are occurring from one industry to another, from the defense to nondefense; but in terms of gauging the changes in the activity of air industry not much more information would be obtained than from the corresponding data on production.

The next set of indicators are what I call purchasing power and consumption. The over-all measure of purchasing power on a month-to-month basis is the personal income of individuals. You will recall that I indicated on chart 2 the national income and I did not refer to it as "purchasing power." The reason is that to measure purchasing power you have to cover some items not included in the national income and at the same time you have to eliminate some items included in the national income. Let me make that clear in this way: National income includes the retained profits of business. In other words, business has a certain amount of profits; one part is passed on in dividends and another part is kept by the corporations. Now, that part which is retained by the corporations would not be included in the measure of purchasing power of individuals, because it is not passed on. On the other hand, personal income includes all transfer payments by the Government and business. For example: When the Government pays out money to veterans for one purpose or another, or the Government pays out certain types of money for relief, those payments do not represent incomes which arise from current production. Consequently, that would not be included in the national income, but would be included in the personal income. So the measure of purchasing power, then, would be better represented by the personal income. Since the personal income data are available monthly, over short periods they

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provide a very good current indication of the strength of demand. When people have more money, obviously the tendency would be for demands for various types of goods to increase.

So it is the personal income which is used for gauging the strength of demand in the economy, particularly the consumer demand. It is available not only by months for the country as a whole, but also by years for the states. By having that information by states, you can also get an analysis of whether certain states are really expanding in relation to other states or contracting. In other words, the measure of purchasing power by states is a very useful indicator of the relative comparison of income changes in a state relative to other states, as well as relative to the economy as a whole.

I should like to emphasize that many analyses in economics are with reference to regions, particularly in periods of defense mobilization. For example: In such periods, certain regions will expand more than others, and it would be of interest for many purposes to see to what extent the expansion is taking place at the expense of expansion in other states. You can see the usefulness of state information to businessmen, because their programs include putting in new stores or opening up new plants. These decisions depend in part on whether the region is an expanding region or a contracting one. We know that some regions of this country are not expanding regions, while others are growing steadily. A worthwhile publication on regional analysis is that just published by the Office of Business Economics, Department of Commerce, called, "Regional Trends in the United States Economy." One disadvantage of the personal income is that it does not allow for taxes paid by individuals--income taxes. To get at a better measure of purchasing power we use the disposable income. This is simply the total personal income less the income taxes paid by individuals, personal taxes paid by them. This is a much better measure; after taxes are paid the remainder would be available for spending or saving. So the disposable income is the measure used by business concerns throughout the country for gauging the extent of demand which is likely to prevail for their products; and most retailers of any size, most manufacturing concerns producing or distributing products directly to the consumer, use the disposable income as a gauge with respect to the relation of their business to the total demand in the economy as a whole.

For example: There are many private concerns which provide consultation service to business. Some of these analyze the sales of a particular business--say a department store--in relation to the changes in disposable income as indicated by past experience; and, on a basis of those changes it is possible to take a look

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ahead to see the kinds of trends which are likely to develop in the sales of that particular department store and even in the various departments of that department store. Thus, to repeat, the disposable income is one of the most widely used measures of purchasing power used by business analysts in order to calculate the level of sales which is likely to prevail in the future on the basis of changes in the disposable income.

There has been over a long period of years a very close relationship between the disposable income and consumer expenditures. The reason we can tie in these sales to the disposable consumer income is that there is a definite relationship between the two. Whenever people have more income to spend, they will spend more for goods and services. The problem of the business analyst is to try to discover that relationship, not only using income as a factor but using other factors, such as the factor of the prices of the goods. A simple straight-line relationship indicates that whenever disposable income increases by 10 billion dollars on the average, consumer expenditures rise by 8 billion dollars. That relationship has prevailed over a long period of years; but there have been periods when it has not held. For example, in the period of World War II, when we had shortages, rationing, and price controls, the relationship did not hold. But generally it has held in postwar years, although in such years the relationship has been at a higher level.

Chart 3, page 13, with regard to measures of consumption, I have indicated that this is included in our gross national product as shown on chart 3. You will see that the top bar represents the total purchases of goods and services--totaling 283 billion dollars; of this, the sum of 194 billion dollars was spent by consumers. Durable goods amounted to 29 billion and nondurable goods amounted to 102 billion dollars in 1950. You will notice how much larger the value of nondurable goods is compared to durable goods. By durable goods we mean such items as automobiles, furniture, jewelry, and all types of electrical appliances. The nondurables are items such as food, clothing, gasoline, and drugs. The total spent on nondurables is much bigger than the total amount which consumers spent on durables, 102 billion compared with 29 billion. Finally, there is the amount which consumers spent on services--62 billion dollars in 1950. That amount, as you can see, is a little more than twice as much as the amount they spent on these durables. Some people tend to regard these durables as being extremely important. In terms of their fluctuations and changes and in terms of their impact on the economy they are important. However, the durables, as you can see, constitute a relatively small proportion of total personal consumption expenditures--about 14.9 percent.

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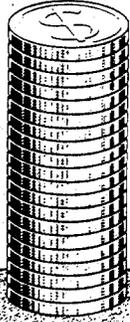
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CHART 3

Of the GROSS NATIONAL PRODUCT totaling \$283 billion in 1950 . . .

\$194 billion, or about two-thirds, was bought by consumers . . .



\$47 billion, or about one-sixth, went into domestic investment (\$49 billion) and foreign investment (minus \$2 billion) . . .



while the remaining \$42 billion was taken by Government.



Of the PURCHASES BY CONSUMERS . . .

Nondurable Goods accounted for \$102 billion . . .



Durable Goods for \$29 billion . . .



and services for \$62 billion.



DOMESTIC INVESTMENT Included . . .

\$22 billion in new construction . . .



\$22 billion in producers' durable equipment . . .



and \$4 billion in business inventories.



GOVERNMENT PURCHASES of Goods and Services Comprised . . .

\$23 billion by the Federal Government . . .



and \$20 billion by State and Local Governments.



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This breakdown of personal consumption expenditures is available for nearly 200 commodities. They cover every type of expenditure made by consumers, such as expenditures for hunting and fishing licenses, for movies, for seeing baseball games, for fees paid to doctors, dentists, and for rents.

Having that kind of total information, it is possible to get some idea as to which items are fairly strong in the economy, and which are the items that are weak.

Right now, for example, the total consumer expenditures are fairly low in relation to the income. What is happening is that there are two tendencies now, with respect to the consumer durables. These purchases are lower because of reduced demand with the tighter credit regulations being a factor. In the more recent months production has been reduced because of the rationing of the use of metals for these items, under the Controlled Materials Plan.

So it is important in gauging the way the consumer economy is headed, to have the detailed data on the consumption items, to see what the impact of these various regulations, these various controls of metals, are on the consumer economy.

This information is published annually for the detailed number of groups which I have mentioned, these 200 groups, and it is also published quarterly for 16 major subgroups. We also have supplementary information by months, which consists of the retail sales by different kinds of businesses. These data are available monthly for about 23 different kinds of businesses. By analyzing the trends of retail sales of department stores, of filling stations, of food stores, of eating and drinking places, of motor vehicle stores, of building and home furnishings dealers---we can appraise, month by month, the development in those consumer segments.

The information on retail sales and consumer expenditures is derived basically from census material for the census years. But primarily it is based on samples---samples of stores---from surveys conducted by the Bureau of the Census, of independent stores, and chain stores. From the use of samples we build this up into national totals and from that we are able to get these various estimates. By the way, we also adjust the fluctuations in these sales to allow for changes due to the season of the year. For example, from November to December there is normally a big jump in sales. Our interest is to find out if there really has been an increase in sales from November to December, aside from the seasonal factor, and we do this by eliminating the seasonal influence.

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These are the major kinds of indicators we have with respect to the consumption and retail sales. I think you will see that both are listed in the "Economic Indicators."

Let us proceed to the next type of indicator—prices. There are essentially two—we will say three—major sources of price information. First, we have the wholesale prices of the Bureau of Labor Statistics. That wholesale price index is broken down into many categories, including farm prices and industrial prices broken down into various major groups. The Bureau also makes available prices of the specific commodities which are used in the various groups. There are something over 900 items which are covered in this wholesale index of the Bureau of Labor Statistics and this is now being expanded to cover many more items.

Wholesale prices are indicative of the inflationary pressures which occur in an economy such as we are in now. When these prices move up we may have trouble ahead in terms of production and real purchasing power.

The consumers' price index is also published by the Bureau of Labor Statistics. The consumers' price index covers something like 165 items. A breakdown of the total is published in very broad groups such as food, clothing, and so on. The consumers' price index today is perhaps one of the most important indicators from the point of view of observing the inflationary pressures. The tying in of wage increases to the rise in the consumers' price index makes this index a very important measure. In other words, if the consumers' price index keeps going up, that would mean that many companies will grant wage increases in line with the rise and, consequently, that would add to the cost of the product. That added cost might be passed on in the higher prices, which again means the companies would again raise wages. This would lead to a wage-price spiral. So it is extremely important that we take a look at this index to see what the factors are which are making it rise.

There is one other index of prices which I might mention. That is the one we obtain in the Department of Commerce through the gross national product and the deflated gross national product. That employs a price index which is applicable to all final products. It is the most over-all index we have in terms of all goods and services purchased. It is available annually and is published by the breakdown of the gross national product in terms of the domestic investment, government purchases of goods and services, and consumer purchases. The index is available on an annual basis and is published in the current "1951 National Income Supplement." This index is now being more widely used because it is more generally applicable to the

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final products than the consumers' price index, although, keep in mind that the consumers' price index is the one to which many companies tie their wage agreements, and by which the problem of wage stabilization is appraised.

Now, a word about monetary statistics. There are many varieties. With this very important index we look at bank loans and interest rates; bank loans and interest rates being information obtained primarily from reports of the Federal Reserve banks and the Federal Reserve Board. These bank loans are divided into various categories, primarily into real estate, commercial, and farm. They are extremely important in gauging the extent to which business is borrowing in order to meet its expansion programs, plant and equipment expansion, or to build up inventory; and, second, these loans provide supplementary information on a short-term basis as to what businessmen are doing with regard to expansion or deflationary programs in our economy. So this is a very useful set of indicators, particularly in times when regulations or controls are imposed. For instance, the data on consumer credit which the Federal Reserve Board publishes is an extremely useful series now because of the fact that we have Regulation W, which controls the terms of financing consumer credit. By such a control we are able to channel the resources which would otherwise have been used for the production of cars and electrical appliances to the more essential uses for defense. In order to gauge the effectiveness of Regulation W, we use these data on consumer credit, which give us indicators as to whether they succeed in the program of holding down these supplements to the consumer incomes; in other words, the supplements being the amounts which consumers can borrow in addition to having their current incomes for purposes of purchasing.

So I don't think you want to neglect in appraising economic conditions, the analysis of these monetary trends. For example, the appraisal of a change in interest rates policy to see whether such a policy is a factor in hindering businessmen from making purchases or whether it is a factor in the other direction. Federal Reserve Board monetary policy has been an extremely important device in many periods in influencing the course of business conditions.

Now for the fifth and last of the business indicator groups—what I call anticipatory statistics: There are two types of anticipatory statistics, and these are the ones which most businessmen use today for the purpose of seeing what is likely to be ahead in the economy. The first type consists of data on plant and equipment expenditures by business. This information is collected by the Securities and Exchange Commission and the Department of Commerce from a large sample of American Corporations, and the corporations

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report to these two agencies not only what they have spent for plant equipment in the previous quarter, but also what they intend to do in the next two quarters. And then, once a year, we ask these corporations to report their programs for a year ahead. You can see the tremendous advantage of having that kind of information, because in this particular area we have the most dynamic segment of the economy.

Chart 4, page 18, gives a breakdown of the gross national product into three major components. The top one is the domestic private investment—in other words, what I have already talked about—plant and equipment expenditures, changes in inventories and expenditures on houses. These expenditures are on a per capita basis, in real terms. The price element is out of this. It reflects physical-quantity purchases on a per capita basis. For the period from 1929 to 1950 you will note the tremendous fluctuations which occurred, shown in the top panel, particularly the tremendous decline during the depression. Even during the recession of 1937-1938 a very substantial decline is indicated--this is the most volatile segment of the national economy. While it is true that these expenditures are high now, in this period of partial mobilization, there will be periods after our defense program is whittled down to some more normal proportions, then we will be concerned again with the problem of maintaining high-level employment, and that concern again will be centered around these capital goods expenditures.

You will notice in contrast that consumer expenditures for goods and services adjusted for price changes are fairly stable on a per capita basis. There is very little dip here in the depression. The 1938-1939 recession did not affect it very much. The relative stability in personal consumption expenditures was primarily concentrated in the area of nondurable goods and services. But in the durable goods area—automobiles, furniture, refrigerators, and so on—you get wide fluctuations, somewhat like what you have in the capital goods segment. Fluctuations in durable goods are primarily the ones which accounted for the dip in the depression and recession years in total real consumer expenditures per capita.

The trends in government purchases of goods and services show a big bulge in the wartime years. You will note I said "government purchases," not expenditures; purchases of all governments--Federal, State, and local—for all types of goods, such as clothing for the armed forces; munitions; pay to the armed forces and pay to civilian employees. On the other hand, payments of interest on the debt; transfer payments and unemployment compensation--these payments are not included in purchases. Government purchases of goods and services on a per capita basis have risen fairly steadily from 1929 through 1950, except for the bulge in the World War II period.

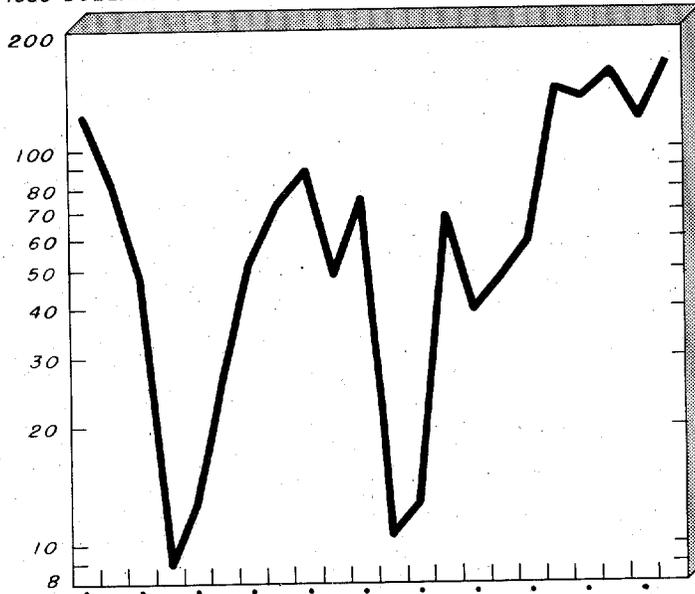
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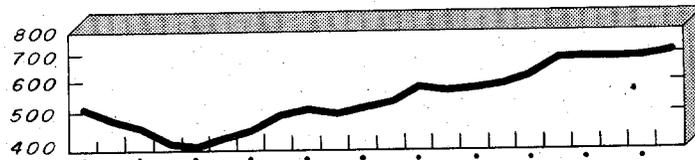
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CHART 4

Domestic investment per capita has shown the widest swings in the general business fluctuations since 1929 in real terms . . .

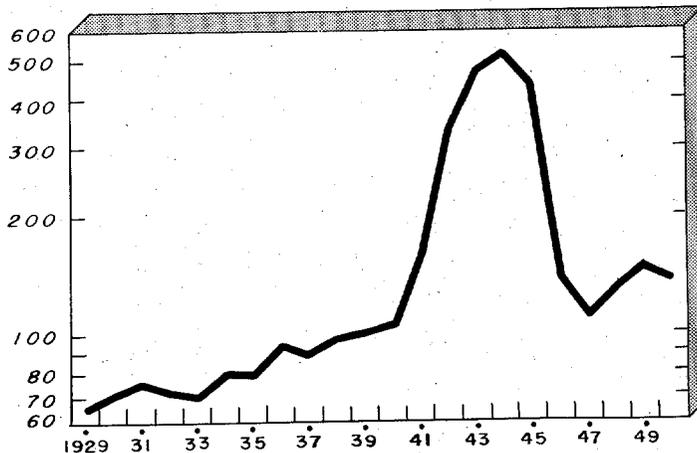
1939 DOLLARS (Ratio Scale)



while real consumption expenditures per capita have been relatively stable, but expanding substantially since mid-nineteen thirties.



Except for the World War II years, real government expenditures per capita have tended steadily upward.



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The point I want to make is, the top panel shows tremendous fluctuation in the per capita goods segment, fluctuations which are associated with the ups and downs of the cycle. This is why we are very much concerned with obtaining a very good measure of the business anticipations for plant and equipment expenditures; and these, to my mind, are the most important anticipatory indicators to look at from the point of view of seeing what may be the future prospects. It is true, of course, businessmen change their minds. For example, in 1929 the iron and steel industry had a tremendous number of blast furnaces on order. Then, when the depression hit in the latter part of 1929, these plans were canceled. Because such changes in anticipations may eventuate we conduct this survey on a quarterly basis. These are key statistics for appraising business conditions, because of the valuable information they reveal. These expenditures generate incomes and employment of a high order. Employment in these capital goods areas is not only large but this is the segment where the highest wage rates prevail--thus generating high levels of purchasing power.

The other types of anticipatory statistics are the new orders and the unfilled orders of manufacturing firms. These are also an extremely important set of data. This information is published by the Department of Commerce and it is relatively new information in the sense that we have had it only about 12 years. In this period a representative group of manufacturing firms have reported to the Department of Commerce the amount of new orders and the unfilled orders each month. In conjunction with that they also report monthly inventories and sales. Now, when new orders are rising, they provide a fairly good indication, particularly if the backlogs are also going up as to what is ahead for manufacturing production. When manufacturing production rises total economic activity generally will also be rising. These indicators of the future activity in manufacturing are also available for all major groups of industries. In other words, they are available for iron and steel industries; machinery industries; transportation and equipment industries. Thus we can see the differential amounts of new orders these various industries are receiving. We also have the orders for the major nondurable goods industries. For example, recently we have had the interesting situation where new orders have been going down in the nondefense industries, but in the defense and supporting industries new orders have been rising very fast, more rapidly than shipments, which indicates tremendous strength in these industries. Thus, currently, the defense and defense-supporting industries are strong and unfilled orders are large; but in the nondefense industries, because of a slackening in buying and because of the limitations on the use of steel, orders and sales have been declining.

The total output of our economy this year has been rising. In the last three months the rate of increase has slowed down with divergencies occurring, as I have indicated. Defense industries

are very strong; sales are going up for defense and defense-supporting industries. Nondefense industries such as textiles, carpets and rugs, and electrical appliances have been showing some weakness.

Chart 5, page 21, I thought this chart would be of great interest not only with regard to the way we have increased our production in this country, but also in relation to what other countries have been able to do. Going back to 1899, this chart shows the average growth in our total production in real terms, in terms of physical quantity. The trend was developed from 1899 to 1929, leaving out the depression years, because the decline during the depression was so big it would have produced distortions to include those years in the trend. You will note the average growth has been 3 percent per year; that is the compound interest rate. If you project the trend into 1949 and 1950, you will notice that these years fall in line with that long-term projection. It is necessary to keep in mind, that the total production growth is compounded out of two factors: an average increase of 2 percent per year in production per man-hour, which reflects the efficiency of labor, management, and machines; the other factor is the growth in our labor force of one percent per year. It is the combination of the labor-force growth and productivity rise which gives the average rate of growth of 3 percent per year in total production.

One other point is, sometimes we are asked to give some idea as to what total output is likely to be 20 or 25 years from now. There are many problems with which many government agencies are concerned with respect to long-range estimates of production. One approach is this: We make use of this 3 percent growth per year and project production on the assumption of full employment. That gives us some notion of where we are likely to be under these conditions. Actually of course we have had large fluctuations around the trend line, but you will notice that over the period production has always come back to this long-term growth of 3 percent per year.

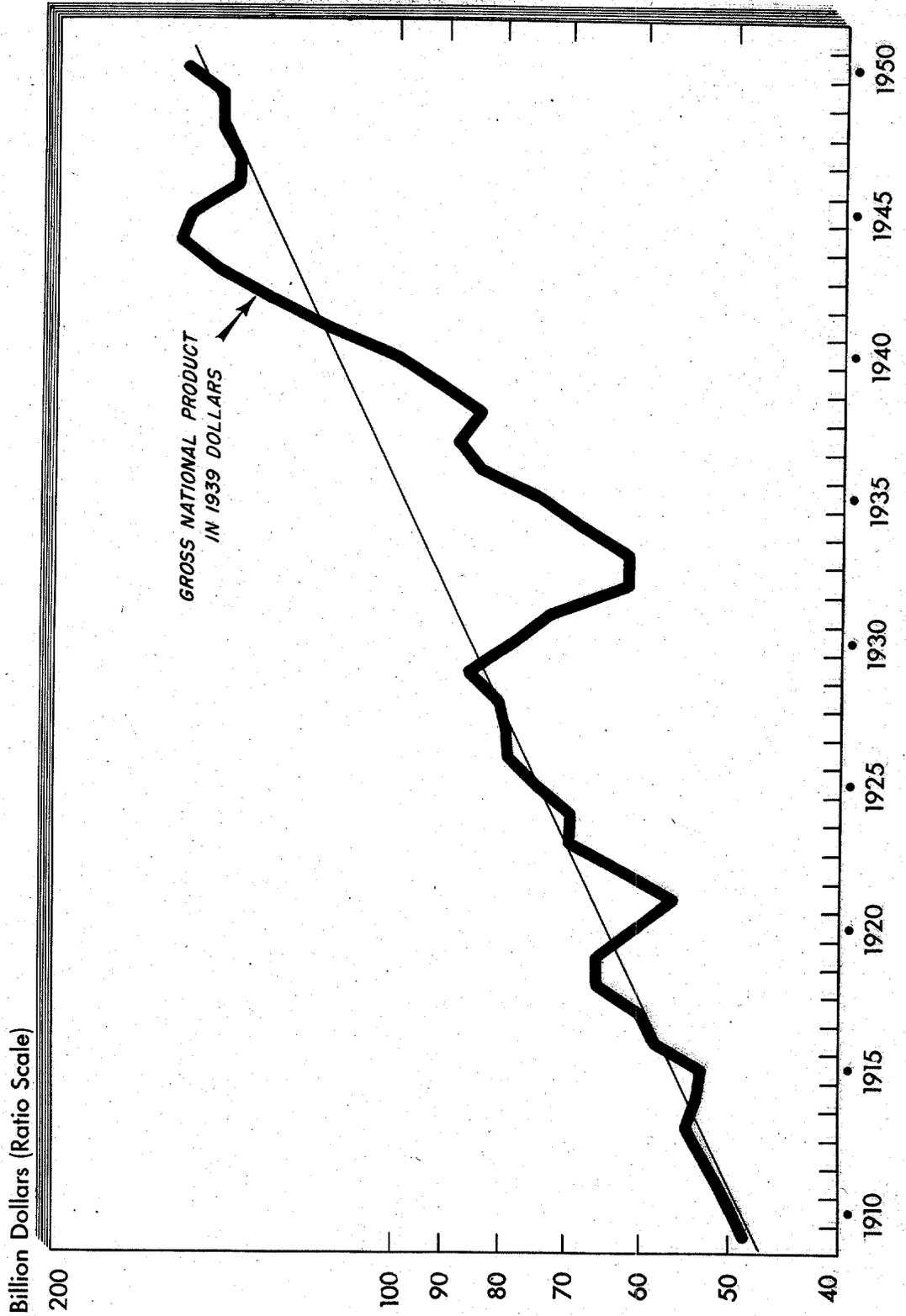
Suppose I leave it here and we will finish with questions.

QUESTION: My question concerns the potential productivity of labor. During the war period labor is potentially able to produce more. We also know that labor practices in a great many instances tend to reduce production; for instance, spread-work ideas, and so on. Nationally we are maintaining a gradual increase, but we are still not realizing our potential. Do you consider we will continue to increase the productivity about this way, or will the present trend of spread work and other such ideas tend to decrease the production?

DR. PARADISO: That's a very good question. I think this--we have had in the last couple of years a very significant increase in productivity. For example, from 1948 to 1949, the increase was about

CHART 5

GROWTH in the volume of national output has been about three percent per year



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7 percent, compared to a normal of about 2 percent. The reason we had during the last war the tremendous rise in production which you see on the chart is that we were able to add to the labor force during that period several million more persons who normally would not be in there. Second, we were able to increase very substantially our hours of work per week. Those are the two basic factors involved in the high production of that period. After the war we did have for a short period a letdown in productivity, not only in this country but in other countries too. But as industry put in more efficient machinery—and in the last five years industry has spent tremendous amounts on new plants and equipment—that has been an important factor leading to much higher levels of productivity. We have not seen the end of increases in productivity. This year industry will spend 25 billion dollars on new plants and equipment. I would say that we will have on the average the normal increase from here on out because of the fact that industry is putting in more new types of equipment and because labor is also pitching in with its contribution.

QUESTION: You have been talking about productivity. Do you think that you can explain the controlling factors on wage increases on the General Motors formula? Considering that General Motors, of course, speaks of a certain class of individual, you can apply that, can you not, to people that don't enter into the labor element—the government worker, I mean. That leaves you a salary and service formula.

DR. PARADISO: Is your question that the formula be applied to those other workers as well?

QUESTIONER: Yes.

DR. PARADISO: The General Motors formula reflects not what General Motors workers actually get in terms of their increased productivity, but rather the average for the economy as a whole. In manufacturing as a whole, for example, the productivity increase is about 3.5 percent per year as contrasted to 2 percent increase for the economy as a whole. It seems to me you can apply that principle to broader groups of workers. The question of whether you should or not is a different problem—but you can apply that principle to the average of the economy as a whole. The problem is that in many segments it is difficult to measure productivity, if not impossible. To apply it to all workers would present some very tough economic problems which require more exploration and analysis than we have time for here.

QUESTION: Doctor, in connection with chart 5, the lower part of the line does not appear to be a true projection. You said it went to 1929 and was projected blindly forward. We have at the

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upper part of the line an intersection rather than a reality. It would appear that this--particularly for 1929--is not a fair average. If you take the years before 1929, the line would slope to the right. It is constructed to show a premise rather than to show what has happened. Don't you think it would be better to fair that line and then come out with our trend?

DR. PARADISO: It is a technical problem. You will notice the line is plotted on a ratio scale. If you plot it on an arithmetic scale you would get this angle here (indicating Chart 5). This line is a least squares line. It is plotted not on an arithmetic scale but on a logarithmic equivalent. You are measuring the ratios. A plot on this kind of a scale gives you the impression that the residuals have not been equalized. Actually, they have, on the logarithmic scale.

QUESTION: Did you leave out the years after 1929?

DR. PARADISO: We left out those because we considered the depression years to have been such an abnormal period that to include them would not give a true reflection of the trend over the total period of years. This is a long-term trend we were considering. If we use the years of the depression, there would be quite a distortion. You would get a line that would run something like this, considerably below the one shown in Chart 5 (indicating). That, according to the best statistical methods, would not be a reasonable long-term trend. I admit you can devote a long time to the problem and consideration of what a trend is. It is a question of judgment that is involved as to where to stop. While it is necessary to be objective in developing a trend, complete objectivity is impossible. In this case it is necessary to make a judgment about whether to use the depression years or not.

QUESTION: Shouldn't that same application be for the abnormal production during the war?

DR. PARADISO: Yes; the war years were not included here.

QUESTIONER: I am sorry. I thought you had included the productivity of the war.

DR. PARADISO: I meant to mention that the war years are not included and the depression years are not. They both are abnormal periods in the economy.

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COLONEL BARNES: Dr. Paradiso, that is all we have time for. I might tell you now in front of the class, I had intended in introducing you to say that you have a reputation for making complicated things easy to understand, but I thought I would be putting you on the spot. I do say, and I think the class will agree with me now, that you have demonstrated that reputation effectively here this morning. Thank you very much.

(5 Nov 1951--650)S/VJM

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