

Productivity (1951)

TRENDS AND FACTORS AFFECTING MAN-HOUR REQUIREMENTS  
IN SELECTED INDUSTRIES

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I. INTRODUCTORY

In its session to this point the Conference has discussed at some length certain broad-scale indications of our past productivity experience. The information embodied in these figures is interesting and important, but it is also important for practical reasons to look behind these over-all measures and explore some of the details and factors that lie behind them. Action takes place in detail as well as in general. Action for higher productivity needs no explanation.

In these times of international challenge it is clearly essential to use all the resources at our command in mobilizing the nation's strength, and especially the ultimate resource--human labor. During the past war the fund of information and data on productivity that we now have was not available or was not used effectively. Little use was made of productivity statistics by government or by industry in broad-scale planning for production during World War II, mostly because the data existing then were not adequate. Our store of knowledge on this subject is still relatively meagre, but there have been considerable strides in developing detailed information which provides a much clearer understanding of our past experience and at the same time gives important clues as to probable trends of the next few years. Such information, if used, can play a major part in mobilizing the full strength of the basic human resource.

Because of this evident importance of developing detailed productivity data and applying them as widely as possible, the Productivity Division of the Bureau of Labor Statistics is working hard now and in the coming months to prepare up-to-date information for as many segments of industry as possible. Various agencies in the Department of Defense are also recognizing the significance of productivity studies to their responsibilities; as a result, there is planned a substantial increase in the professional organization of the Productivity Division. Long-range as well as short-range ends are in view.

II. RECORD OF THE PAST

It may meet the convenience of many members of the Conference for us to review very briefly the record of productivity trends in this country and the economic environment in which these changes occurred. Members who are completely familiar with these matters may produce patience for the moment.

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During the three decades preceding World War II all the available information indicates a rather steady long-term gain in output per man-hour for all United States manufacturing industry combined at a rate of about 3 percent per year <sup>1</sup>/<sub>1</sub>, with only temporary interruptions during the depressions. Each depression period was followed by a rapid gain which restored the loss and maintained the long-term trend. Improvement in the nonmanufacturing industries was at least equal to that of manufacturing, in some cases greater.

Conditions during this period were favorable to rising productivity. We had an expanding market, full utilization of capacity, continuing factory improvements of all types at a rapid pace, and the rise of new industries, which characteristically have improved their productivity at a faster pace than mature industries. Periods of stability or loss were short and apparently were due mainly to declines in the volume of production and in the use of available capacity. American industry generally showed an alertness and drive to improve output, expand markets, and derive the maximum of production and profit from a given volume of input. Continuing small day-to-day improvements in design of product, plant layout, equipment, work flow, and work techniques were the general rule--and in their millions probably contributed more to the increase in national productivity than did the smaller number of spectacular developments such as the continuous strip mill.

During the period of World War II, however, a new set of influences affected the productive efficiency of our industry. The normal product pattern of many industries was completely disrupted, and severe strains were placed upon other important industries. In sharp contrast, the war brought to a few industries a tremendous boom in production, and unprecedented increases in productivity. Four groups may be identified.

First, the so-called civilian-type industries were hindered in their operations by many wartime conditions. These "low priority" industries had interruptions in their supply of materials and manpower. They had difficulty in obtaining new equipment and often settled for outmoded machinery. In addition, curtailed output required operation at low levels of capacity utilization in some of these industries. In the clay construction products industry, for example, output per man-hour fell 20 percent between 1939 and 1943, while the volume of production fell 50 percent.

Second, other civilian-type industries expanded under war contracts for similar products, and many experienced productivity increases by virtue of this extra volume and also accompanying standardization of product. The machine tool industry was able to increase productivity during the early war years, owing to the phenomenal wartime expansion in production which reached a peak late in 1942. During 1939 to 1942, man-hours expended per unit decreased 8 percent. In the later war years, the decline in the volume of production resulted in a drop in productivity in this industry. Other examples are construction machinery, industrial equipment, and footwear. The rayon and allied products industry not only made further improvements in processes, but also produced large amounts of heavy denier tire cord; productivity in this industry continued to increase during the war.

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<sup>1</sup>/ 1909-39, BLS data. Compound interest formula.

Third, a number of industries were completely transformed as the country went from peace to war. The shipbuilding industry, for example, was converted from a small custom industry to a mass-production industry specializing in the production of a few standardized types of vessels. Labor requirements in the production of Liberty ships dropped from 1,150,000 man-hours in December 1941 to 515,000 man-hours per ship during December 1944. This 55 percent decrease in unit labor requirements is equivalent to a productivity increase of 120 percent in 3 years time. There were large decreases in unit man-hour requirements for other types of ships as well. The airframe industry achieved even larger increases. Between the first quarter of 1942 and the last quarter of 1944 production of airframes multiplied sixfold, and productivity increased more than 160 percent during the 3 years. While complete data are lacking, there are indications that productivity increased rapidly in many other munitions industries as well.

Fourth, some industries were able to utilize their capacity more fully during World War II. The railroad transportation industry, for example, experienced a 40 percent increase in man-hour output between 1940 and 1944. Unlike the steady advance made during the prewar period, this large increase did not stem from improvements in technology, but resulted largely from a more continuous use of equipment and a more complete loading of cars without a proportional rise in labor requirements.

Summarizing, the World War II years brought a lowered over-all rate of growth in productivity. What has happened since World War II?

After the war ended and the post-war readjustment was completed industrial productivity rose more rapidly than during the war years but the 1949 level was far below that which would have been realized if the long-term trend of the previous decades had been continued.

By 1949 output per man-hour was well above both 1939 and the wartime levels. Data for 1950 are not yet available, but it is thought likely that a substantial increase occurred as the result of a high rate of industrial activity and the cumulative effect of high rates of capital investment for a new manufacturing plant and equipment in the postwar years. In constant dollars, the rate of investment in 1948 and 1949 was almost four times that of 1939, more than twice the prewar peak in (1941), and more than twice the level in 1945. The investment program reached a peak in the fourth quarter of 1949, when total capital investment in manufacturing industry reached an annual rate of over 9 billion dollars. Investment fell off somewhat in 1949 and in early 1950, but rose rapidly again after mid-year 1950 as a result of the Korean crisis.

It would be incredible if this tremendous investment for new and improved plant and equipment by thousands of tough purchasing agents had not provided the basis for a high level of productivity in 1950. Much of the new equipment bought after the war was not actually bolted down until sometime in 1949, and it takes a good many months for a new installation to show its full improvement. This may well account for the relatively low gains in 1948-49. After operations are successfully adjusted, however, the aggregate favorable impact of the new investment must inevitably have been reflected in terms of high productivity in 1950, and should serve as a cushion in some of the unfavorable influences expected during the next few years.

Some tangible statistical evidence of the effect of technological improvement on production efficiency has been developed under the direct reports program of the Bureau of Labor Statistics. The first chart shows several of the comparisons we have made between unit man-hour trends for firms which have introduced technological improvements in recent years, and those which did not. Almost all such comparisons reveal substantial advantages accruing to the group of firms making improvements.

Comparisons of this type are affected, however, by influences other than those upon which the classifications into single groups are based. The trends, therefore, often require further analysis for a full understanding of their implications. In one industry, for example, almost every firm which reported improvements in plant equipment or methods had engaged in rapid and very large expansions of plant capacity and output to fill war contracts. Because of this rapid expansion these firms were troubled by shortages of materials and workmen, and production operations were not well organized. Plants that did not expand were not so troubled. Consequently, the average trend for this group of plants was decidedly less favorable than the trend for those firms which had made little or no change in their operations or equipment.

Two interesting characteristics suggest themselves in respect to the relationship between man-hours expended per unit and the introduction of technological improvement. First, it appears rather conclusively that any saving of unit man-hours is realized only a number of months (in some instances a year or more) after the new arrangement. The sharpest reductions normally occur during the year immediately following the change-over, meanwhile, productivity usually suffers during the change-over and for some time thereafter.

Second, our data indicate that if the classification of two groups of firms is held constant over a period of years following the initial comparison, the initial divergence of trend tends to disappear as firms in the group which had originally reported no improvements gradually introduce such changes and effect savings in man-hour requirements.

The comparisons on which these opinions are based covered varying numbers of years during the decade 1939-48; but the relationships they illustrate should apply to any period. If so, it is prudent to assume that the improvements in plant and equipment which have been introduced during the years since the end of World War II represent one of our strongest assets as the Nation moves into the present tense and critical period of large-scale production for defense. American productive plant is now larger and probably more efficient than at any time in our history, and we are strengthened by the experience which industry gained in war production during the first half of the past decade.

## FUTURE PRODUCTIVITY

It is likely that many industries will experience productivity changes during the next few years generally similar to changes during World War II. There are several important differences, however, in the present economic environment of American industry which may make these expected changes different in degree from those we passed through in the early 1940's and certainly it is probable that the timing will be different.

Before the outbreak of World War II, we had just emerged from a period of prolonged depression. We had, in general, a large reserve supply of workers, and many industries were operating well below capacity. The steel industry, for example, was operating in 1939 at about 65 percent of capacity. There is every indication that the substantial gains in productivity which were achieved in this and many other industries were accomplished in part because of the increase in utilization of capacity as demand increased. Until at least 1942, workers could be recruited readily for enlarged staffs.

At present, however, most industries have been operating at levels close to capacity. (Using the steel industry again as an example, operations in 1950 were at about 96 percent of capacity.) In addition, total manufacturing employment is at or near an all-time peak, and it will prove difficult to expand the labor force rapidly, or to recruit experienced workers. Consequently, it is improbable that the rapid increases in productivity which were realizable in some areas of industry in the early 1940's can again be achieved.

In general, it is to be expected that industries devoted to military items (such as tanks, ships, and aircraft) will after periods of initial adjustment, experience substantial increases in productivity as output expands. If volume production of armament items is not attained, and our industrial plant is instead geared to a potential output of diverse items, we cannot look forward to significant productivity gains in this sector. In other words, if our efforts are devoted largely to establishing facilities for an all-out defense effort instead of achieving volume production, productivity gains in this sector will be small.

Civilian industries with military orders as a significant part of their production should show modest productivity improvement after a time. A large part of total employment devoted to the defense effort will fall within this category.

The typical experience for many industries in this category during the past war period was a spurt in productivity between 1939 and 1942, and a severe decline between 1943 and 1946. The spurt in productivity was generally due to the increase in production volume and to the advantages accruing from the ability to concentrate output on a few models specified by procurement authorities. The subsequent declines in productivity were brought about as crippling shortages of material, components, and labor interfered with normal manufacturing operations. During the present defense effort we should look forward to similar trends, though they may occur within a shorter period of time. There is little room for the gains which come from increases in capacity

of operation. On the other hand, we have close to full employment at the present time and materials are in short supply. If large numbers of industrially experienced women and older workers are drawn into the labor market, and radical shifts in output occur, as we move into defense production, we may encounter again a confused situation of supply in which materials are short and often are received so late as to bring about losses in efficiency. We may face declines in productivity in these industries within a year after they shift into defense output, rather than within two to three years as occurred previously.

It appears certain that civilian-products industries which have no relation to the war effort (and are assigned low labor and materials priorities) will have a variable, but generally unfavorable, productivity trend, the degree of change depending on the availability of materials, the manpower situation, and possibilities for additional technological improvement. It appears almost inevitable that strictly civilian products which depend upon materials in scarce supply will experience losses in productivity as their output declines.

It is important to note that industries in this latter category during the World War II period were able to counteract these unfavorable conditions by product changes which reduced labor requirements. Partly aided by wartime controls, industries such as footwear and men's cotton garments were able to attain great savings by reducing the variety of styles and simplifying the products. For example, in men's shirts fewer styles were made, lighter fabrics were used, the length of the shirt was reduced, and fewer stitches per inch were run to speed sewing operations. These economies were often of such scope as to more than offset the unfavorable production conditions. Such product changes during a period of defense effort are perhaps inevitable. They are extensive, however, covering many industries and in fact represent some degradation of product to the consumer.

We have at the present time, however, an important potential for productivity increase, which we did not utilize during World War II. This potential is the gain in efficiency and manpower which we may attain through the systematic use of productivity data in manufacturing operations. This favorable factor may be sufficient to outweigh some of the undesirable trends which we are anticipating.

During World War II the use of productivity statistics to reduce labor requirements was virtually neglected. Some limited attention was given to this problem, but the possibilities were not really explored. Among plants producing munitions and war-essential civilian items, great differences in manufacturing cost and man-hour requirements were noted. In many instances, companies produced the same items with differences in man-hour requirements as great as ratios of 4 to 1. It is common among plants in numerous industries for the spread in man-hours utilized per product to be of the order of 2 to 1. This spread is seldom due to differences in the design or structure of products which may require more labor. Nor can this spread be generally attributed to any single difference in the use of particular machinery or processes. It is almost always the result of hundreds of minor differences in factory organization, utilization of equipment, and work methods. Much of the know-how possessed by the efficient plants is transferable to the rest of the industry, and most of it is accessible through plant productivity surveys. Since American industry has always



been characterized by a generous interchange of technical information, can we, during the present emergency, afford to neglect the systematic exchange of productivity data? Plant productivity surveys, followed up by some new program for the exchange of technical data, can make available to industry a greater net body of information on manufacturing efficiency than can be encompassed by programs covering individual techniques, given types of machinery or particular work methods.

In our direct productivity studies, it was found that there was an exceedingly wide variation from plant to plant in man-hours expended per unit of product. For some industries such as the manufacture of metal-forming machinery, man-hours expended per unit varied as much as 600 percent. With far shorter extremes the same tendency holds true even in long established and highly competitive consumers' goods industries such as men's dress shoes and shirts. For medium-priced men's dress shoes surveyed in 1948, the lowest one-fourth of the plants in labor requirements averaged .9 man-hours per pair. The highest quarter of the plants averaged 83 percent more man-hours per pair, while the second and third quarters averaged 24 and 43 percent more hours respectively. For men's dress shirts the percentages were roughly the same. Particular attention must be given to the riddle why some plants consume labor sparingly while others with almost identical equipment and layout and often owned by the same company require substantially more man-hours per unit of product.

Since the principal task I set myself in preparing this discussion was that of looking behind the over-all trends, I should like to point out that the diverse year-to-year industry experience of the past decade and the continued diversity which is inevitable during the coming years highlights a basic aspect of productivity which is often overlooked. Generalities regarding steady gains in output per man-hour for the economy as a whole gloss over individual industry trends. As can be seen in Chart 2 the changes in productivity during the years 1939-47 ranged from extreme gains to extreme losses. It is apparent that no single industry can safely assume that its productivity is increasing on the basis of an increase in any index we prepare which combines the experience of many industries. Furthermore, in our planning for defense production and manpower mobilization, we must be sure to consider past trends in productivity for each industry with which we deal, and derive the best possible estimates as to its probable future trend. Otherwise, we may make very costly mistakes.

#### DIRECT AND INDIRECT LABOR

One of the most important facts revealed by recent data provided by Bureau series is the disparity in trends for direct and indirect factory labor during the past decade. At a time of rising output, when overhead man-hours should have declined on a per unit basis, indirect labor charges actually increased in many industries, and in others showed a smaller drop than direct labor per unit. In a number of cases, continued year-to-year savings in direct labor categories were more than offset by increases in man-hours for indirect labor functions. As you can see in Chart 3, between 1939 and 1948 man-hours expended per unit in the direct labor functions declined for all but 3 of the 15 industries included. In most instances, the reductions were fairly substantial.

In sharp contrast, increases in indirect labor per unit were reported by 9 of these 15 industries; in most instances the increases were large. Only one industry (fertilizer manufacture) reported a substantial decline in indirect man-hours per unit, traceable to an unusually large rise in output and utilization of plant capacity, and to more modern materials-handling.

It is evident that the continuing improvements in machinery, equipment, and work methods constitute one factor accounting for the divergence in trends of direct and overhead labor, since most such innovations are directly designed to improve the efficiency of the productive operations. In many instances, as a matter of fact, the introduction of new and more complicated automatic machinery, which reduces direct labor per unit, actually leads to an increase in indirect labor, since the new machinery requires more man-hours for servicing, maintenance, set-up, and repair. Some of the equipment innovations, of course, do reduce indirect labor man-hours -- as an example, the adoption of powered materials-handling equipment always sharply lowers the man-hours required for materials handling, which is almost always classified as indirect labor.

Our plant studies also show that the rapid growth of many industries during the past decade has in itself tended to increase the disparity between direct and indirect labor trends. Almost inevitably, as a factory increases in size and volume of output, production gradually moves more and more to a standardized mass-production, line-assembly basis. This transition brings with it a reduction in direct man-hours per unit, as efficiency is improved through standardization of output, job simplification, and work rationalization. This very transition, however, generally increases indirect labor man-hours per unit of output since more and more servicing functions (indirect labor) are developed to move materials to the line in the proper places, and to plan, coordinate, and control the flow of materials and work in process. In addition, functions such as reworking of faulty items, control, and grinding of tools, and the set-up of machines are transferred from the direct production staff to crews of specialists classified as indirect labor.

Despite these reasons for the relative increase in overhead man-hours per unit of output, it is apparent that many of the factors, such as increased mechanization, size, and specialization which operated during the last decade, must also have been in operation in previous decades. If productivity in the past has increased at a rate of about 3 percent per year it is obvious that indirect trends must have been more favorable then, or else direct man-hour trends must have improved at a far more favorable rate than in the past ten years. This is unlikely, and it is possible that we are encountering new factors affecting industry which we do not fully understand as yet.

Several officials have recently highlighted this problem in discussions regarding productivity trends, and have questioned the recent expansion of operations in plants beyond a certain volume, since in doing so any reductions in direct labor per unit might well be more than offset by increases in indirect labor. This question, as well as many other related ones, will present knotty problems to the managerial staffs of American industrial establishments during the next few years. We in the Bureau feel that the provision of detailed statistical information regarding the characteristics of our national productivity may prove helpful in the efforts of coping with such problems.



There has been much discussion during the years since the war concerning the possibility of eliminating excessive overhead labor which developed during the years of war production. Undoubtedly, management has exerted efforts to squeeze out surplus indirect labor costs. We have every indication, however, that during the past two or three years indirect labor per unit of output in many industries has been steadily increasing despite such efforts. This rise was accentuated in a number of cases by the decline in utilization of plant capacity in late 1948 and in 1949.

Current pressures to increase output rapidly, and the renewal of many of the troublesome conditions incident to production for defense will undoubtedly intensify the tendency toward rising factory overhead labor. Consequently, it is obvious that one of the most severe challenges to American management during the coming years is that of controlling indirect labor, to prevent the runaway increases which occurred during the years 1942-46. We do not believe that the recent disparity between the prewar and postwar ratios of direct and indirect labor can be easily overcome. We are sure, however, that efforts to maximize output, utilize labor effectively, and improve productivity must move simultaneously along both the direct and indirect labor fronts. Each management decision should be based on a thoughtful evaluation of the net gain in efficiency to be realized in terms of both prime and overhead labor functions.

#### UTILIZATION OF CAPACITY

The utilization of plant capacity is another important factor affecting man-hours. Data collected in our productivity program and information available from other sources have convinced us that it is one of the most important single influences in short-term changes in productivity in individual plants. It is responsible in many cases for differences in efficiency from plant to plant. Because of the importance of this analysis, we are currently working on plans for much more comprehensive studies of capacity utilization than those which we have carried out so far.

In every comparison made of man-hour and capacity utilization data collected in our direct reports program, there was an obvious correlation between the relative level of man-hours per unit and the percent of capacity utilized, as illustrated in Chart 4. Our recently completed study in synthetic rubber lends evidence that this relationship is especially strong in the chemical industries. During periods of extreme urgency, if designed capacity is exceeded too much or too rapidly, man-hours per unit tend to rise sharply as the point of maximum efficiency is exceeded. Government and management must be chary of expanding operations past the point of designed capacity, since in doing so they are inviting sharply increased cost in terms of man-hours expended and also in money. Government procurement personnel will do well to avoid, as far as possible, the placement of contracts with facilities which are already committed up to their capacity since the cost of additional production without new plant will almost certainly be exorbitant.

Effective plant capacity during the present defense period can be increased, perhaps substantially by two measures. If reduction of product variety through elimination of models, sizes, and types, is pursued by systematic study and active plant cooperation, we can expect gains above what was

accomplished in the early 1940's. Wartime controls then were directed toward this purpose, but they were not often planned with sufficient study nor were they extended as far as they might have. The other measure to increase effective capacity deals with reducing as far as possible the shortages of materials and components which plagued production during the post war period. Despite high priorities many plants had to halt assembly lines or make costly shifts to alternate production while they awaited essential items. The improvement of allocation plans and delivery schedules is a formidable problem, but the potential increase in capacity which can result is so great that it demands much greater attention.

## VII. DETAILED PRODUCT DATA

One of the most valuable new tools in our kit of productivity data available for application in planning and in administrative action during this period of war production is the body of statistics on averages and trends in man-hours expended per unit for representative products in major industries. Such data reveal surprising variations in the direction and extent of year-to-year changes in man-hours per unit for different products in a single industry segment. The trends are determined mainly by the pattern of fluctuations in output and the relative availability of materials and component parts for each product, although many other factors are important. The nature of the manufacturing methods used (job-lot or line-assembly) effects the trend of man-hours per unit over certain periods; so do the characteristics of the products themselves (for example, simple, standardized items; or intricate, highly complex, custom-fabricated machinery). For standardized products manufactured by line-assembly methods unit man-hour trends are generally most favorable during periods of continued high volume production, with assured supplies of labor and materials. In periods of intermittent or low-volume production, or when materials are not available in a smooth and assured flow, products manufactured by the more flexible job-lot method usually show more favorable trends.

As an example of divergent trends for several major products of an important war-supporting industry, let us consider the experience of the construction machinery and the industrial equipment industries during the 1939-47 period. The composite trend for all reported construction machinery items did not show any great year-to-year fluctuation. In the series for the individual products, however, productivity changes of considerably greater magnitude occurred. Generally favorable trends were reported for tractors and power shovels, while a substantial improvement in efficiency took place in the production of three-wheel rollers. In contrast, losses in productivity ranging from moderate to severe occurred for other product groups. Particularly severe increases in the number of indirect labor man-hours per unit were reported for concrete machinery, motor graders, crushers, and the ditcher--bucket loader group. In the case of industrial equipment, a very sizeable gain in efficiency was indicated by the index for all products combined. Substantial reductions in unit man-hours were reported for products such as bearings, mobile materials handling equipment, compressors, and motors. Extremely adverse trends, however, were reported by producers of fans, blowers, and belt conveyors.

Information of this type is of extreme importance for application in tests of feasibility (in manpower terms) of proposed production programs, and for application in the inter-industry relationships technique. Serious errors could easily result from the application or projection of trends for entire industries in cases where the analysis should be in terms of individual products of the industry.

#### VIII. DETAILED PLANT DATA

The detailed data we have collected during the past four or five years indicate interesting and significant variations in the productivity experience of plants in different size classes, using different production methods, located in different geographical areas, or with different production patterns. Information of this type is interesting in itself, and becomes of immediate practical use in connection with mobilization planning.

In the comparisons of trends for groups of firms classified according to method of production, line-assembly factories in the metal-working industries, such as construction machinery, machine tools, industrial equipment, or electrical appliances, invariably showed more favorable trends during the 1939-47 period than did groups of firms using other systems (chart 5). The men's dress shirt industry reported a different pattern. This industry experienced a substantial loss of volume during the war years, a sharp increase in output in 1946 and 1947, and a drop in 1948, which was accompanied by a large increase in the variety of sizes and styles of shirts manufactured. As a consequence, firms utilizing the relatively inflexible line-assembly system experienced less favorable trends in unit man-hours than did firms employing other methods. The divergence was especially marked in the unit man-hour trend from 1947 to 1948, since line-assembly firms were completely unable to maintain their relative level of efficiency in the face of the rapid change in the output pattern necessary to meet the public demand for a wide variety of colorful patterns and styles.

It is perhaps even more important to note that trends for firms classified according to size of plant or diversification of output reveal sharp interindustry differences in the relative experience of plants in any one classification. For small plants, for example, relatively favorable trends were reported in most of the industries studied (such as soap, construction machinery, men's shirt, or fertilizer). In some industries, such as women's footwear or electrical appliances, however, the small plant trend was less favorable than those for most other size-classes (chart 6). Similarly, firms making only a single product line experienced comparatively favorable unit man-hour trends in the household electrical appliance, industrial equipment, and home radio receiver industries; in the metal-forming equipment and household appliance industries, however, firms making a diversified pattern of products reported a substantial advantage over the groups of factories specializing on one product (chart 7). This variation is probably due to the predominant characteristics of each industry. In some instances the flexibility of operations incident to production of a diversified product line outweighs the advantages inherent in standardized production of a limited range of items, while in other instances the reverse is true.

#### IX. FACTORY PERFORMANCE PROJECT FOR ECA

I have attempted to point out to you some of the highlights of the findings, implications, and uses of our productivity statistics. I should also like to report to you that we are just on the threshold of a new type of study which will serve as a valuable complement to our existing programs. At the request of ECA, the Bureau has undertaken the task of compiling comparative statistics of man-hours and factory performance in American Manufacturing establishments for use in ECA's program of technical assistance to the Western European countries. Since the man-hour data will be collected for important departments and key occupations in the plant, they will serve as an aid in isolating trouble spots in the European facilities. It should thus be possible for factory managers to apply corrective action in areas where it will do the most good. The information on our production practices will, we hope, indicate some lines along which such measures may be directed.

#### X. CONCLUSION

I should like to conclude by restating my belief that we have much to offer in our body of productivity data which is of direct use to both industry and government during this critical period. ~~However, we will need more and more~~ information if we are to successfully carry out our national responsibility, and the Productivity and Technological Developments Division is prepared to devote every effort toward this goal.