

Productivity
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MANPOWER REQUIREMENTS AND THE SUPPLY OF LABOR

PRODUCTIVITY TRENDS AND UNEMPLOYMENT.

by
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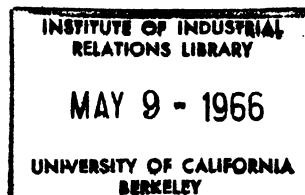
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While my particular topic is "Productivity Trends and Unemployment," I have kept in mind that this conference is primarily concerned with the impact of automation and other forms of technological change. Productivity--as measured by output per man-hour--is an indicator of technological change in the economy, although it is also affected by changes in efficiency and other factors.

Analysis of unemployment involves more than a simple productivity relationship. The influence of labor force changes and of output changes in the private and public sectors of the economy are also important, and the interaction of all these factors affects unemployment.

Recognizing these qualifications, I will try to focus attention on the relationship between technology, as indicated by productivity, and employment requirements.

The three major points to be covered are: (1) What has been happening to productivity, (2) what has been the relationship between productivity change and employment change, and (3) what is the future of productivity change and its impact on employment.



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There has been a great deal of controversy and difference of opinion expressed over the impact of technology on employment. I think that part of our problem is an inadequate distinction between the aggregate versus disaggregate approach, the overall trends and impacts versus detailed events. Daniel Bell in an article on "The Bogey of Automation" has said it in simple but picturesque terms: "In discussing automation, it may be useful to keep in mind an old Jewish saying: For example is no proof."

We can find many spectacular examples of technology, including automation; of great savings in labor resulting from new technology. We can also find many humdrum examples of lack of technological progress in small custom product industries and in personal service industries. But to maintain a proper perspective, we should direct a major part of our inquiry to the question of what is happening at the aggregate level, that is, what are the overall trends and relationships and what is the total productivity and employment picture.

I do not mean to imply that the small events are to be ignored, no matter what the aggregate figures show. We know that in a dynamic economy many changes are taking place, affecting many individual workers. The problems of job security, job transfer, of jobs for new entrants to the labor force, and of income maintenance need special attention. The problems for these workers do arise and will not be solved adequately, automatically.

While you may be familiar with much of the recent literature on productivity trends, let me review briefly some of the statistics.

Probably the most familiar number is the approximately 3 percent average rate of increase in output per man-hour in the private economy in the postwar period. (This will be raised a little bit as a result of recent revisions in GNP data.) A question is frequently raised as to whether or not this increase represents a continuing acceleration in the rate of productivity gain. It is certainly clear that this is a substantially higher rate of gain than that which prevailed in the period 1909-1947, when it averaged 2 percent per year. It is less clear, however, that there is continuing acceleration in the rate. We had high average rates of increase in the early postwar years, then some slackening in the middle and late 1950's. In recent years, the rate has picked up again, averaging about 3-1/3 percent for the last five years. The first half of 1965 indicates a less-than-average rate of gain in productivity, but these figures are still preliminary.

While these total figures for the private economy are the ones we need to look at most intensively, from the point of view of examining the total employment picture, it is also useful to examine the trends for some of the component sectors. A substantial part of the high rates of gain in the postwar period were accounted for by the very large increases in agricultural productivity. In the

remaining part of the private economy, the postwar rate is still higher than the long-term rate but the difference is not as great. In manufacturing, the postwar rate, as a whole, has only been about 2-1/2 percent, but this rate seems to be increasing fairly substantially--for the last five years it has averaged 3 percent. And if we examine the components of manufacturing, we find that (1) output per man-hour of production workers only has been moving up more rapidly than that for all employees and (2) various individual industries show very large productivity gains. These different rates for agriculture, for manufacturing and its segments are important in terms of some of the more detailed impacts of technological change, and I will say more about this a little later.

In evaluating the impact of productivity--that is, of technology--on the overall or aggregate levels of employment, it is not sufficient to examine merely the pace of productivity change. If output goes up as fast as productivity, there will be no decrease in aggregate employment. So, an important part of the question of acceleration is whether or not a rise in the productivity rate is being matched by a rise in the output rate.

Let us see what the relationship has been between productivity and output and whether it has changed in recent years. Analyses we have prepared in the Bureau of Labor Statistics show very high correlation between the changes in productivity and the changes in output. In other words, productivity usually rises

sharply when output rises sharply. This does not always happen but it happens on the average. Our real pinch on employment, however, occurs when output rises slowly because at those times productivity continues to go up--not at its usual rate but quite often at a faster rate than output. During these periods of time, of course, employment declines and unemployment increases. As output increases at a faster and faster rate, productivity also increases more rapidly but usually not as fast as output.

Thus, we see the importance of output increases, i.e., of economic growth--the latter tends to be accompanied by higher rates of productivity gain, but with an accompanying tendency for greater margins for employment. At the same time, there is a persistence in technology, an irreversibility of technological attainment. When the economy slows down, we do not revert to more primitive forms of technology--and the continuing, though less-than-average, increases in productivity combined with decreases or small gains in output result in a decrease in aggregate employment.

A second part of this question is related to whether the productivity-output-employment relationships are changing. There is little or no evidence that the gap between productivity and output has been narrowing in recent years, for the total private economy. In other words, when equivalent rates of output are taken into account, the rates of productivity gain are also about the same, so there is no diminution of the rate of employment increase.

In manufacturing, however, productivity in recent years has been going up faster in relationship to the trends in output. This means that for every unit increase in manufacturing output, we are getting less employment than we did in the past.

This comment about manufacturing brings us back to the point I have made before. We need some perspective on the relationships between productivity, output, and employment at aggregate levels. However, this overall view does not preclude the need to examine the economy in detail. If we dissect the economy, the relationships may differ. In fact, technology has differential impacts throughout the economy. The varying developments by industry, as well as by occupation and locality, result in displacement and changing job opportunities. They affect specific individuals or groups--sometimes very harshly. The adjustment of these workers to a new job environment is not automatic--automation does not have a self-correcting feedback of manpower adjustment. That is why we need an active manpower program (which other speakers are covering at this series of meetings).

What about the future? Can we expect radical changes, no matter what the previous statistics show?

There are many exciting new technologies being developed and applied in industry. The computer--which can have a dramatic impact on communications, on the control of manufacturing processes, on office recordkeeping and calculation. The fuel cell which, when

adequately developed, can provide energy now produced by mechanisms which are much more complex and much more costly. The laser--which has all kinds of possibilities in the fields of transmission of information, cutting metals, and in medical surgery. I would not be surprised, in the next 10 or 20 years, to be able to buy paper garments (more complicated than baby diapers) which can be worn once and thrown away.

In other words, we can anticipate that there will be many dramatic changes in the kinds of products we consume, in the methods of producing goods and services, and in our day-to-day lives.

What do these changes imply for the productivity of the entire private economy? While specific innovations will have a major impact on selected parts of the economy, they are not likely to occur all at once. Some industries are making very little technological progress. The personal service industries, in particular, fall into this category and much of our economic activity is shifting into the service area. Much of the new technology is high cost and employers may be reluctant to scrap existing equipment until they are more confident of the returns on new capital investment. There is a certain amount of inertia and resistance to change on the part of both employers and workers.

Taking into account the rapid changes in technology, examples of which are all about us, and also the moderating factors just mentioned, I would expect productivity to continue at least at

its postwar average rate of gain. This rate and its implications for employment are governed by several factors, among which are the following:

1. Maintenance of an adequate rate of growth in the private economy, through fiscal, monetary or other programs.
2. The need to employ substantial resources in meeting America's goals. Daniel Bell, in commenting on the work by the National Planning Association on "Dollar Costs of National Goals," points out that these costs are "about \$150 billion more than the estimated total gross national product itself if we grow at the rate of 4 per cent a year during the coming decade."
3. Continuation of an active manpower program, in both the private and public sectors, which assists workers, both experienced and inexperienced, in accommodating to the requirements of new technology and in enlarging their qualifications to find the new jobs which may become available.

In fact, in this kind of favorable environment we can sustain even higher rates of productivity increases, with its potential benefits for more goods and services per family or increased leisure time.