

Mr. Greenspan comments on the importance of technological development and the value of education for economic growth in the United States Remarks by the Chairman of the US Federal Reserve System, Mr. Alan Greenspan, at the Building Dedication Ceremonies at the Kenan-Flagler Business School, University of North Carolina on 12/9/97.

I welcome the opportunity to join Dean Fulton, President Broad, President Emeritus Spangler, Chancellor Hooker, Hugh McColl, and the many other distinguished guests on the podium today. It isn't every day that we have the opportunity to dedicate a new building devoted to the research and training that our young people need for conducting business in a global setting. This new facility -- the McColl Building -- has been equipped with state-of-the-art information technology that will enhance the ability of the faculty and students of Kenan-Flagler to prepare for an exciting future in our global economy.

The University has made this important commitment at a time when our businesses and workers are confronting a dynamic set of forces that will influence our nation's ability to compete worldwide in the years ahead. One of the most central of these forces is the rapid acceleration of computer and telecommunications technologies, which can be reasonably expected to appreciably raise our standard of living in the twenty-first century. In the short run, however, the fallout from rapidly changing technology is an environment in which the stock of plant and equipment with which most managers and workers interact is turning over increasingly rapidly, rendering a perception that human skills are becoming obsolete at a rate perhaps unprecedented in American history. I shall endeavor to place this most unusual phenomenon in the context of the broader changes in our economy and, hopefully, explain why the value of education, especially to enhance advanced skills, is so vital to the future growth of our economy.

Wealth has always been created, virtually by definition, when individuals use their growing knowledge to interact with an expanding capital stock to produce goods and services of value. Assisted by the whole array of market prices, entrepreneurs seek to identify the types of products and services that individuals will value, especially the added value placed on products and services that customers find better tailored to their particular needs, delivered in shorter time frames, or improved in quality.

This striving to unbundle the particular characteristics of goods and services in order to maximize their value to each individual inevitably results in the shift toward value created through the exploitation of ideas and concepts, rather than simply the utilization of physical resources and manual labor. Indeed, over the past century, by far the smallest part of the growth in America's real gross domestic product reflects increased physical product measured in bulk or weight. Most of our gains have been the result of new insights into how to rearrange physical reality to achieve ever-higher standards of living. We have dramatically reduced the physical bulk of our radios, for example, by substituting transistors for vacuum tubes. New architectural, engineering, and materials technologies have enabled the construction of buildings with the same space, but far less physical material, than was required 50 or 100 years ago. Most recently, mobile phones have been significantly downsized as they have been improved.

The increasing importance of new insights has, of course, raised the value of information creation and transfer in boosting standards of living. Thus, it should be no surprise that new computer and telecommunications products have been accorded particularly high value by consumers and business and, hence, why companies that successfully innovate in this field exhibit particularly high stock market values.

Breakthroughs in all areas of technology are continually adding to the growing list of almost wholly conceptual elements in our economic output. These developments are affecting how we produce output and are demanding greater specialized knowledge.

The use, for example, of computer-assisted design instruments, machine tools, and inventory control systems has given our former, more rigid factory assembly lines greater flexibility. Businesses now can more quickly customize their production to changes in market conditions; design cycles are shorter, quality control has been improved, and costs are lower. Offices are now routinely outfitted with high-speed information-processing technology.

The accelerated pace of technological advance has also interacted with the rapid rise in financial innovation, with the result that business services and financial transactions now are transmitted almost instantaneously across global networks. Financial instruments have become increasingly diverse, the products more customized, and the markets more intensely competitive. Our nation's financial institutions, in turn, are endeavoring to find more effective and efficient ways to deliver their services.

In this environment, America's prospects for economic growth will greatly depend on our capacity to develop and to apply new technology -- a quest that inevitably will entail some risk-taking. One lesson we have clearly learned is that we never can predict with any precision which particular technology or synergies of technologies will add significantly to our knowledge and ability to gain from that knowledge. Moreover, America's ability to remain in the forefront of new ideas and products has become ever more difficult because of the rapid international diffusion of technology. Nonetheless, to date, we have not fallen behind in converting scientific and technological breakthroughs into viable commercial products.

But, to be fully effective in realizing the gains from technological advance will require a considerable amount of human investment on the part of managers and workers who have to implement new processes and who must be prepared to adapt, over their lifetimes, to the ongoing change that innovations bring.

Clearly our educational institutions will continue to play an important role in preparing workers. While we all are concerned about the performance of American elementary and secondary schools compared with those in other developed countries, there is little question about the quality of our university system, which for decades has attracted growing numbers of students from abroad. However, the notion that formal degree programs at any level can be crafted to fully support the requirements of one's lifework is being challenged.

A great deal of innovation and development has been occurring in the business sector where firms are striving to stay on the cutting edge, in an environment where products and knowledge rapidly become obsolete. Education, as a result, is increasingly becoming a lifelong activity; businesses are now looking for employees who are prepared to continue learning, and workers and managers in many kinds of pursuits had better look forward to persistent hard work acquiring and maintaining the skills needed to cope with a dynamically evolving economy.

The recognition that more productive workers and learning go hand-in-hand is becoming ever more visible in both schools and in the workplace. Linkages between business and education should be encouraged at all levels of our education system. Your business school is an excellent example of how our educational institutions are building bridges to the private sector that will have payoffs in how well graduates are prepared to meet the challenges of an

increasingly knowledge-based global economy. The growth of high-tech industry here in the Research Triangle, as well as in Silicon Valley and Boston -- all areas rich in educational and research institutions -- is no accident.

In the private sector, a number of major corporations have invested in their own internal training centers -- so-called corporate universities. Some labor unions have done the same. More broadly, recent surveys by the Bureau of Labor Statistics indicate that the provision of formal education on the job has risen markedly in recent years. By 1995, 70 percent of workers in establishments with 50 or more employees had received some formal training during the twelve months preceding the survey. The incidence of training was relatively high across age groups and educational attainment. Most often this training was conducted in-house by company personnel, but larger firms also relied importantly on educational institutions.

At the same time, we must be alert to the need to improve the skills and earning power of those who appear to be falling behind. In the long run, better child-rearing and better basic education at the elementary and secondary school level are essential to providing the foundation for a lifetime of learning. But in the shorter run, we must also develop strategies to overcome the education deficiencies of all too many of our young people, and to renew the skills of workers who have not kept up with the changing demands of the workplace.

The advent of the twenty-first century will certainly not bring an end to the challenges we are facing in a rapidly changing world. Americans will surely adjust to a frenetic pace of change, as we have in the past, but we must recognize that adjustment is not automatic. All shifts in the structure of the economy naturally create frictions and human stress, at least temporarily. As those frictions dissipate, however, I have no doubt that the economy will emerge healthier. And, if we are able to boost our investment in people, ideas, and processes as well as machines, the economy can operate more effectively as it adapts to change. This holds the potential to create an even greater payoff of a broadly based rise in living standards over the longer run. Your new Kenan-Flagler facility will enhance this University's ability to meet the challenge.