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United States Governmental Support For Innovation

*Kent H. Hughes**

I would like to speak briefly this morning, giving you a sense of the broad Clinton Administration economic strategy on competitiveness. Then I would like to focus on the very important role of technology because, as you know, the Clinton Administration has moved technology center stage.

Let me sum up our view of the world by saying we, at least on the economic side, see ourselves wrestling with three enormous changes that are challenging the way we think, the way we do business, and the way we create policy in the United States.

The first change and challenge is globalization. That, of course, is nothing new to this particular group, but it has been something new for the United States. I can remember back when I was in graduate school teaching Economics 101. The senior professor stressed that we cover fiscal and monetary policy. He stressed that we mention several other subjects including banking. He then paused and said, "Of course, the international chapter is optional." You could not really imagine anyone in any part of the world making that statement today. It is certainly not optional for us.

Our manufacturers routinely face international competition at home and abroad. For most of them, the competition really starts at the factory door. The old distinction between domestic and international markets is increasingly blurred. It is true in telecommunications, and it is very much true in terms of capital movements. Today a small home builder in Kansas City looking for a commitment for a loan at a specific interest rate, for money, has to keep his or her eye on the key financial institutions around the world. If they move in a particular way, so might interest rates which, in turn, could affect the cost and availability of money. This means that when you are doing business, when you are thinking policy in the United States, you really have to think in terms of the global economy.

Second, there has been an enormous range of technological changes none more than in the area of information technology. As these information technologies have advanced, they have begun to change the way we do business and the way we manufacture. They

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The following text was compiled from the transcript of the remarks made by Mr. Hughes at this Conference.

have changed the way we live, and increasingly they will change the way we learn.

The change in technology has been coupled with an increasingly sophisticated global consumer. There was a time when in the United States you could no longer compete on price alone. We shifted as the world did to a point where we focused on quality as well as price. The terms of competition are changing again. As we face a sophisticated consumer that realizes what technology allows us to do, we have to have a good price, a good quality, an almost tailor-made product in terms of meeting that particular consumer's needs. Much of that has been facilitated by and driven by information-age technology.

And finally the third change, particularly for the United States, a big change, was the end of the Cold War. I cannot emphasize how much the Cold War was a unifying mission for virtually the entire United States. It had, as well, a major impact on our industrial base, on innovation, and on the focus of our resources. By some estimates, thirty-five percent of our scientists and engineers were linked to national security or defense industries. We relied on those industries as a source for what, in the end, became major civilian technological innovations. You can look at a number of areas of national strength in the United States and see that in their distant past they benefitted from our commitment to national security research.

Well, that era, of course, is over, and it has, coupled with the other changes, forced us to take a new look at how we respond to the world economy. We are doing it in four ways. I would like to sum up the Administration's competitiveness strategy or long-term productivity growth strategy in the United States with the four T's: tools, training, technology, and trade.

By tools I mean the right climate for private sector investment. In no small measure, the focus of the Administration on deficit reduction was an attempt to create a larger pool of low-cost patient capital to facilitate new investment in plants and equipment.

Second, of course, is training. We have emphasized not only training in a narrow sense but the fact that we moved into an era of lifelong learning. We have attempted to strengthen that whole chain of lifelong learning at a number of specific points. The Administration has worked for greater investments in Head Start and other programs that focus on early childhood learning. We have put a new emphasis on kindergarten through twelfth grade education. For the first time, the United States will have national standards in areas such as math, science, and literature. The standards are designed to give students a real focus and to, in a sense, empower parents so they can walk into their children's school or the local PTA meeting and say, "Well, now, we are supposed to have world class standards. Are we really meeting them here?"

We also realized as we looked around the world that we did not do

a particularly good job at handling the transition from school to work for the non-college bound student. Our response has been to work more closely with industry on this question, and encourage a whole new approach to school and to work. We are trying to borrow and adapt ideas from Europe, Japan, and elsewhere and are drawing on some of our own traditions to try to make that transition from school to work more focused and more effective. And of course, we have continued to try and make significant U.S. strengths in higher education by making sure that those doors are open for a greater number of Americans.

Third, of course, is trade. We have done a great deal on the trade side. Unfortunately, I missed some of Gary Hufbauer's presentation, but I am sure he talked about the range of international initiatives that have taken place over the last two or three years: the passage of NAFTA; the successful conclusion of the Uruguay round; the decisive movements in APEC to make a commitment to long-term open markets in the Pacific basin area; and I suspect we will see more this year. From our competitiveness strategy or long-term growth strategy point of view, we are trying to open up opportunities for American workers and American businesses all around the world.

The fourth and final T is technology. The administration is pursuing a whole broad-based technology policy here. Why technology? You have already heard some of the evolution of modern economic thinking that has identified innovation and technology as a key to long-term economic growth. It was, in part, that importance of technology to the economy that brought it center stage in the last presidential campaign which was focused on, "It is the economy, stupid."

The change to a focus on technology not only reflects this new sense of global competition, the new sense of opportunity, the new sense that we need to look on economic growth as a national mission, but also the new approach in the Department of Defense. Increasingly, they emphasize what they refer to as dual use technology. DOD has found that the traditional approach of relying on military specifications and dedicated industrial facilities falls short on two grounds: one, cost; and two, the ability to keep pace with technologies that are being driven by the civilian side of the economy. If they want to keep pace with advanced materials, with electronics, even, in some cases, with power systems, they want to look to and adapt civilian technologies to national security purposes.

All of these forces have focused our attention on technology policy. To pursue civilian technology policy, the Clinton Administration has taken a number of specific steps. We start with a significant commitment to science and technology in the federal budget. By 1993, we were already spending about seventy to seventy-two billion dollars on research and development. Thus, we have started with a significant commitment. We have not made so much major increases in the overall

size of that commitment as we have shifted a portion of those resources to a focus on civilian technology.

In the Commerce Department, there have been two approaches that capture part of what we are doing. We focused, for instance, on a whole series of pragmatic partnerships working with universities, working with industry, working with other segments of the nation in an attempt to speed innovation and make sure that we are not missing research in which the private sector is likely to under-invest. We have at Commerce, for instance, the Advanced Technology Program (ATP). This is a grant program. If you were to make an application to this program, your application would be peer reviewed in terms of its technical merits and in terms of its business prospects — the likelihood that that particular innovation would eventually turn into a useful product. In addition, the program requires a significant private sector match that has averaged about fifty percent. Many companies have invested a great deal more before they have reached the point where they can make an application.

In turning to a civilian technology policy, we were concerned about the changes in industrial innovation. Part of the change was one of speed, the need to move quickly from innovation to product, and in part it was the shift in American business away from the Bell research kind of laboratory to research focused on the very short-term product development. Our sense is that the old Bell lab is unlikely to be replicated in this very competitive kind of environment.

Second, we were concerned that technology simply was not being diffused effectively to the 370,000 small to medium-sized businesses in the United States. Again, we looked at our own past. We looked around the world for the best practices. We found that in both Europe and Japan there were institutions that facilitated the diffusion of technology to small and medium-sized businesses. At the same time, we looked at our own past and found that the agriculture extension services have been very effective.

We put those ideas together to create something called the Manufacturing Extension Partnership Program (MEP). The MEP works with small and medium-sized businesses so they can move quickly to best practice technology. It might be the need for training. It might be plant layout. Preliminary estimates based on the work of the original seven of these technology centers shows them to have been successful and very cost effective.

Third, we are continuing to meet the need for a strong technological infrastructure as part of creating a climate for innovation. Perhaps the most attention has been focused on the national information highway and the potential for information technology to support economic growth and foster further innovation. Unlike the national highway system, of course, this particular highway system is being almost entirely

built by the private sector.

We have worked with a small pilot program for the not-for-profit sector: hospitals, educational institutions, and so forth, with a few experiments where they themselves try to find what works best for education, or for hospitals, in terms of using information technology. And our hope is that a successful pilot will not only make that one institution more productive, but will stimulate the creation of a whole new market for next generation applications in terms of information technology.

One of the things that keeps driving us back to the four T's that I mentioned — tools, technology, training, and trade — is that, as you talk to industry about what creates a climate for innovation, several elements emerge. Technology partnerships, whether with other private firms, with a university, or with the Federal Government, are only part of the story. In fact, looking at the whole climate for innovation drives us back to our basic four T's.

As you may know, Vice President Gore is now leading what he refers to as Reinventing Government II, or REGO II, which focuses on how the government goes about implementing and defining regulations. A flexible investment and responsive, reinvented government helps create a climate for innovation. Global markets are clearly important. More and more high-technology businesses, if they are going to be effective and competitive, need access to global markets.

Many of our best corporations talk about the need for an improved education and skill base in the work force. Some of the best report hiring only high school graduates, only to find that they perform at an upper grade school level in terms of math, science, and overall English and communication skills. We are the only industrial country that imposes that kind of burden on its manufacturing sector. More and more companies are working with the kindergarten through twelfth grade schools, doing more training themselves, sometimes setting up their own universities or schools inside their corporation. Wherever we can, we are trying to facilitate that change.

Finally, of course, there are the technology partnerships themselves, and we are continuing to work closely with industry, not only in a piecemeal kind of fashion, but working with industry to get a sense of where they think the high payoff but high-risk technological areas are.

To sum up, let me say again that we are an Administration wrestling with the three C's, globalization, the advent of information age technology, and the end of the Cold War. We are meeting change with a four-T strategy of tools, training, technology, and trade. We are absolutely convinced that we have entered an era of pragmatic partnerships, an era in which the United States and other industrial countries need to adopt what good companies do, which is a habit of continually benchmarking ourselves to the best practices in other countries. It is a time of enormous opportunity for the United States and for other in-

dustrial countries, but it is going to take a thoughtful, thorough approach to make the most of those opportunities for all of our citizens.