US-Japan Conference

Introduction

On behalf of the University of Michigan, I would like to welcome you to Ann Arbor for what has become a spring tradition:
The 7th Annual US-Japan Automotive Industry Conference

While my role is primarily to welcome you on behalf of the University, let me take this opportunity to take off my hat as Provost for a moment, and instead don my hat as a member of the National Science Board for several remarks that highlight the importance of this particular gathering...

First, it is particularly fitting that such a conference should be scheduled each year in this, the industrial heartland of our nation.

The view from Michigan..."the Rust Belt"...

While people generally look at the midwest as a relic of America's industrial past, let me suggest that in many ways, it can also be viewed as America's future.

Of course, we have had to learn how to adapt to a brave, new world of economic competition...

The days of low interest rates, limited foreign competition, slow-moving technology, stable markets, and mass production processes that once allowed our industries to thrive in a sheltered environment have long since passed.

The signs of challenge are obvious...

7-fold increase in international trade since 1970
market for nearly all significant manufacturing industries has become world-wide
70% of goods we produce compete against merchandise from abroad
Budget deficit
trade deficit
displaced workers
marginal industries

The world economy is now in control

Yet, something else is happening in the heartland of America...

The Challenge of Change

The challenge of dramatic economic change...
Traditional industry economy is shifting to a new, knowledge-based economy
just as our industrial enterprise evolved from an agrarian society at the turn
of the century.
This change has gripped the Rust Belt...
A transition is occurring in which..
Intellectual capital has replaced
financial and physical capital as key to economic development
Some examples:
Industrial production is steadily switching away from
material and labor intensive products and processes
to knowledge intensive processes:
In a car, 40% materials, 25% labor...
In a chip, 1% materials, 10% labor, 70% knowledge!!!
Increasing manufacturing production has come to mean
decreasing blue collar employment!
In the 1920s, 1 of 3 was a blue-collar worker
today 1 in 6 and dropping fast
probably to about 1 in 10 within a couple of decades...
In all developed countries, "knowledge" workers have already
become the center of gravity of the labor force.

The Age of Knowledge in a Global Economy

The major force is technology itself!
At one level, technologies of transportation and communication
make possible an integrated economy.
Tremendous new industries have been created by new
technical knowledge: electronics is the obvious example
of the last three decades; biotechnology may be the
example for the coming three decades.
These industries depend on knowledge as the most critical
resource.
Intellectual capital -- brainpower -- is increasingly regarded as the key element
needed to compete effectively in a highly technological and rapidly
changing global economy.
But knowledge is highly mobile...it is not tied to
geographic regions as coal or iron or oil.
By contrast, the knowledge revolution is happening worldwide

and at a very rapid rate.

That new technology means economic development and trade is widely understood in developed nations who have been sharply increasing their investments in science and technology.

Even less developed nations are also learning the lesson and drawing knowledge from the developed world or generating it themselves.

Brazil, India, Korea are quickly advancing along the competitive path that Japan took 30 years before.

The morale of the story:

In the age of knowledge in a global economy, the economic strength of a nation, its security, the well-being of its citizens...

Will depend on its science and engineering base... That is, the collection of people, institutions, equipment, and facilities that make basic research and innovation possible

Clouds on the Horizon

But here America faces a particularly serious challenge...

US faces a S&E manpower crisis of unprecedented proportions

Some examples:

1. Per capita production of US engineers lowest among industrialized nations:
2. Proportion of graduating seniors who major in science and engineering is smaller today that it was in 1970s. Particularly severe drops in physical sciences and mathematics. (Fallen by 40% over past decade)
3. Major decline in graduate enrollment
4. More than half of engineering PhDs are now foreign

NSF Study

Traditional source of S&E college students is declining 25%-30% falloff in HS graduates by 1992

Assuming that same fraction (4.8%) choose to enter S&E, and assuming constant demand (very conservative), there will be a cumulative shortfall of 700,000 by 2010!

A National Response is Required

And people must be the major focus...

Because people -- not equipment or buildings -- are the source

of creativity.
They generate the knowledge that makes the technological innovation possible. They are the workforce that makes society run.
They are our researchers and teachers, our leaders, managers, and decisions makers in modern technological society.
For this reason, the Reagan administration has chosen as its highest priority in the year ahead major new initiatives aimed at strengthening the source of intellectual capital in this nation.

And that is where we come in...

Our schools, colleges, and universities will be the primary source of the intellectual capital necessary to fuel our knowledge-based economy...
Hence, it is most appropriate that we join industry and government in a new partnership to respond to the challenges of the Age of Knowledge in a Global Economy!!!
And, in this sense, I suggest that it is most appropriate that our University host one of the key annual conferences exploring the implications of this new competitive age!

Enough of perspective...

Let wish you the best for what I am certain will be an exciting and rewarding conference.