GOVERNMENT, UNIVERSITY, INDUSTRY RESEARCH ROUNDTABLE (GUIRR)

Asymmetrical Globalization of American Research Institutions

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Good Evening. Thank you for a gracious introduction – it was a marvelous way to cover what is clearly a checkered past.

I had particularly asked that no mention be made of my being an economist -- as you know, President Truman started the downfall of the economics profession: tired of hearing 'on the one hand, on the other hand,' Truman cried out for a 'one-handed economist.'

What is worse – in the midst of today's unforeseen economic turmoil, Washington is taking its revenge by circulating a new definition of 'economists': a group that is fairly good at numbers but does not quite have the personality to be CPAs.

I am also aware of the challenge of trying to provide some food for thought to an erudite gathering just after a sumptuous meal.

It brings to mind a story taken from ancient Rome:

> The gladiators walked into the Coliseum to the cheers of the crowd. Then the lions were loosed, with another cheer. Then – to the crowd's surprise – the lead gladiator walked over and whispered into the ear of the lead lion. The lead lion trotted back to his fellow lions, gave a few indistinct growls, and then, to the crowd's amazement, the lions yawned, stretched, and went to sleep.
>
> The crowd was furious. Augustus Caesar demanded an explanation from the lead gladiator. He told the emperor that he had simply told the lion:
>
> "If there was a meal, there would have to be an after dinner speech."

Not every partnership is quite as distinct as the understanding reached by the gladiators and the lions. But in a rapidly globalizing world, we are seeing more and more combinations that offer both promise and, perhaps, peril.

In the few minutes that I have, I would like to:

1) Give a brief overview of how innovation is itself going global.

2) Note how changes in the United States are driving new innovation partnerships and, at the same time, changing the U.S. innovation system.

3) Suggest how U.S. policy:
   a) Should respond to the reality of global and internationally-dispersed innovation;
   b) Should respond to the way that individual initiatives of U.S. companies and universities sometimes complement the national strategies of current and potential *competitors*;
   c) Can respond to the current reliance on international science and technology (S&T) talent while improving the number of Americans choosing S&T careers.

MANUFACTURING, FINANCE, AND INNOVATION GO GLOBAL

Historical Comparisons

The fall of the Berlin Wall in 1989 and the collapse of the Soviet Union in 1991 marked the end of the Cold War and the start of a truly global economy. Many popular authors, such as Tom Friedman, Clyde Prestowitz, and Fareed Zakaria, have spelled out the global changes that are taking place.

At the same time, globalization is not new. Periods of extensive trade, the sharing of ideas, and advances in communication occurred during the times of: European exploration; pre-World War I use of the gold standard that coincided with waves of European immigration and industrialization; and during the periods marked by the extensive influence of first Europe and, more recently, the United States.

Yet, this period of globalization is different. Its unique elements include the lower cost of international transportation, especially air travel; extraordinarily fast methods of communication; digital technology; and a vast spread of knowledge.

U.S. Innovation Goes Global

Changes in the 21st century include the following:

- Manufacturing is producing parts instead of products and we see the development of extensive global supply chains;
- Design now follows manufacturing;
- Innovation is increasingly dependent on local conditions, available talent, and cost;

- Institutions and corporations have gained significant experience with the global economy and are better at working across borders;
- Technology is changing the way people communicate, particularly with better Broad Band and video conferencing;
- *Others* are adopting and responding to the U.S. innovation system:
  - Developing their universities and emphasizing human capital;
  - Attempting to adopt other parts of the U.S. system;
  - Actively recruiting U.S. institutions for advice and consulting;
- American institutions are going global:
  - The IBM is a leading practitioner of being a good citizen everywhere it operates;
  - Universities are becoming global institutions: their history is in the U.S., but increasingly they see their future as being global;
  - The U.S. government is becoming more internationally-focused (examples include the NSF Office of International Science and Engineering and the individual agreements/initiatives of other departments).

Industry

- Changes at home include incorporating the ideas of "core competency" and the Japanese lean production model, involving:
  - The importance of shareholder value;
  - Reliance on international talent;
  - Development of transnational networks
  - Just-in-time approach to inventory, but on a global basis;
- Changes abroad include the spread of digital capacity and talent;
  - National strategies adapt to prioritize value added and technology for the future.
- Evolving business models have meant:
  - Pragmatic partnerships
  - Bayh-Dole goes global – but intellectual property rules are more flexible abroad
  - At the Extreme:
    - The Hollywood movie or the political campaign become business models;
    - "Core competence" becomes the ability to assemble, manage, and commercialize the results of a team
  - Continued pressure for quarterly results/role of options
  - In the U.S. context, increased reliance on markets to exclusion of other institutions.

Universities

- Viewing themselves as global institutions
- Drawing on international students – particularly for graduate school
- Moving from starting a program overseas to collaborating with overseas universities to establishing full-fledged campuses and now to creating a *global partnership*. Eight universities are forging an international partnership:
    - National U of Singapore

- Peking University
- Australian National University
- The Swiss Federal Institute of Technology
- University of Copenhagen
- University of Tokyo
- University of California, Berkeley
- Yale University

We have gone from the G8 gathering of heads of state to the U8 gathering of universities.

U.S. Government

- General sense: the more innovation, the better, because it leads to:
  - Development gains
  - Foreign policy plusses
  - Support of U.S. institutions
- But no clear strategy:
  - No sense of who is doing what
  - How effective is the level of coordination?

WHAT SHOULD THE POLICY BE FOR BUSINESS, UNIVERSITIES, and THE U.S. GOVERNMENT?

Scientists think of global innovation. Economists think of global welfare and comparative advantage, with markets relied on as the superior guide to efficiency, prosperity and, even to some degree, innovation. Finally, political scientists, by way of contrast, think of political power as part of a win-lose world.

There will be continuing tension among and between:
- Global realities
- The strategies of nations
- The U.S. and other governments, which are still responsible for national, economic, and social security
- Nation-states – will still fund innovation at home or forge international partnerships but, in either case, they will seek a geographically-defined return

Industry

- There are clear advantages to going global – the 'BRICS and beyond' have enormous markets and a large supply of talent – so businesses should be responding to clear market incentives
- Important to think through the long-term risks – to intellectual property; to creating rivals
- GUIRR should return to asking about current incentives, and whether they are:

- Aligned with long-term corporate interests
- Aligned with the national interest

- A conference of stakeholders should be held, involving business and:
  - Department of Defense/Defense Science Board
  - Key White House Leaders
  - OSTP/NSC/NEC
  - The Research Community
  - NSF/NIH
  - University Associations

Universities

- Obstacles to global engagement:
  - State Universities
    - Face dwindling state support
    - Governors see as key to state growth
    - Nation sees as important for reaching major, national goals
  - Private Universities
    - Research is federally-funded
    - Reliant on alumni – who may see a more nationally-defined than globally-defined role
- Cannot assume continued reliance on foreign students:
  - More students will begin to attend universities in other parts of the world:
    - Rise of Chinese etc. universities
    - U.S. overseas campuses
  - Respond by:
    - Paying more attention to the half of all American students who drop STEM majors after their first-year classes
    - Establishing better treatment of post-docs
    - Working to strengthen the entire learning system (K-12, universities, and beyond)
    - Creating strong university associations – to produce annual assessments of gains/losses

U.S. Government

There is a tension between the perspectives of the National Science Board (NSB) and the Defense Science Board (DSB):

- NSB: "International Science and Engineering Partnerships"
  Sees going global as a way to:
  - Solve world problems;
  - Keep pace with new, overseas centers of excellence;
  - Energize the global and the U.S. economies.
  - "Economic development, capacity building of civil society, elevation of women and underrepresented groups, and productive, socially responsible solutions to global S&E problems." (NSB February 14, 2008) This may be a bit optimistic.

- By way of contrast, in a report over two years ago, the DSB warned about the erosion of the U.S. semiconductor industry and its negative implications for national defense.

The Global Dimension

1. Recognize that most major problems are global in nature: flu pandemics, climate change, energy security, widespread poverty, transnational crime and violence, and insecure supply chains
2. Assess and monitor the global engagement of U.S. institutions:
   a) Include universities, businesses, and federal laboratories in the global innovation project
   b) Adequately fund the statistical agencies to measure change
   c) Have some sense of the flows of technology in and out of the country
3. Give matching grants to school districts that provide K-12 instruction in certain select languages so that STEM professionals can more easily collaborate/learn internationally
4. Propose to the WTO and WIPO versions of model intellectual property sharing agreements

The National Dimension

1. Strengthen the U.S. innovation system, according to the recommendations in *Rising Above the Gathering Storm*
2. Create the environment that encourages innovation and investment:
   a) Focus on schools at all levels
   b) Maintain a modern 20th and 21st century infrastructure
   c) Create a foundation to finance innovation as a complement to venture capital
   d) Attack deficits – fiscal and trade and current account
3. Develop a National Innovation Strategy – called for in the Council on Competitiveness's *Innovate America*
4. Counter pressures from overseas governments that use influence or financial incentives to force or induce technology-sharing by companies or universities
5. Create an ongoing dialogue with top-tier research universities, global businesses, and key government agencies

Innovation is necessary to confront virtually every challenge we face – disease, climate change, national security, energy and food security, global poverty, and maintaining the prosperity that underlies the American Dream.

Thank you for inviting me to speak today. It is a pleasure to be in such august company – a community that lives and defines the heart of America's innovation system and, in so doing, America's future.