Rising Above The Gathering Storm: Energizing and Employing America for a Brighter Economic Future

Statement of

Norman R. Augustine
Retired Chairman and Chief Executive Officer
Lockheed Martin Corporation

And

Chair, Committee on Prospering in the Global Economy of the 21st Century
Committee on Science, Engineering, and Public Policy
Division on Policy and Global Affairs
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Mr. Chairman and members of the Committee.

Thank you for this opportunity to appear before you on behalf of the National Academies' Committee on Prospering in the Global Economy of the 21st Century. As you know, our effort was sponsored by the National Academy of Sciences, National Academy of Engineering and Institute of Medicine, which are collectively known as the National Academies. The National Academies were created by President Lincoln and chartered by Congress in 1863 to advise the government on matters of science and technology.

Our study had as its origin a conversation which took place at the National Academies with Senator Lamar Alexander a number of months ago. As a result of that discussion, the Academies were requested by Senator Alexander and Senator Jeff Bingaman, members of the Senate Committee on Energy and Natural Resources, to conduct an assessment of America's ability to compete and prosper in the 21st century—and to propose appropriate actions to enhance the likelihood of success in that endeavor. This request was endorsed by the House Committee on Science.

To respond to that request the Academies assembled twenty individuals with diverse backgrounds, including university presidents, public school educators, CEOs, Nobel Laureates and former presidential appointees. The result of our committee's work was examined by 37 highly qualified anonymous reviewers who were also designated by the Academies. In undertaking our assignment we considered the results of a number of prior studies which were conducted on various aspects of America's future prosperity. We also gathered over sixty subject-matter experts with whom we consulted for a weekend here in Washington and who provided over 100 recommendations related to their various fields of specialization.

It is the unanimous view of our committee that America today faces a serious and intensifying challenge with regard to its future competitiveness and standard of living. Further, we appear to be on a losing path. We are here today hoping to elevate the nation's awareness of this situation, which has been developing for several decades, and to propose constructive solutions.

The thrust of our findings is straightforward. The standard of living of Americans in the years ahead will depend to a very large degree on the

quality of the jobs that they are able to hold. Without quality jobs our citizens will not have the purchasing power to support the standard of living which they seek and to which many have become accustomed; tax revenues will not be generated to provide for strong national security and healthcare; and the lack of a vibrant domestic consumer market will provide a *disincentive* for either U.S. or foreign companies to invest in jobs in America. Further, the weakening scientific and technological base in America will be diminished in its ability to meet such important challenges as the provision of clean, secure, sustainable, affordable energy.

What has brought about the current situation? The answer is that the prosperity equation has a new ingredient, an ingredient that some have referred to as "The Death of Distance". In the last century, breakthroughs in aviation created the opportunity to move people and goods rapidly and efficiently over very great distances. Bill Gates has referred to aviation as the "World Wide Web of the twentieth century". In the early part of the present century, we are approaching the point where the communication, storage and processing of information are nearly free. That is, we can now move not only physical items efficiently over great distances, we can also transport *information* in large volumes and at little cost.

The consequences of these developments are profound. Soon, only those jobs that require near-physical contact among the parties to a transaction will not be opened to competition from job seekers around the world. Further, with the end of the Cold War and the evaporation of many of the political barriers that previously existed throughout the world, nearly three *billion* new, highly motivated, often well educated, new capitalists entered the job market.

Suddenly, Americans find themselves in competition for their jobs not just with their neighbors as was the case in the past but with highly motivated and well qualified individuals from around the world. The impact of this was initially felt in manufacturing, but soon extended to the development of software and the conduct of design activities. Next to be affected were administrative and support services. Today, "high end" jobs, such as professional services, research and management, are impacted. In short, few jobs seem "safe." Consider that –

- U.S. companies each morning receive software that was written in India overnight in time to be tested in the U.S. and returned to India for further production that same evening—making the 24-hour workday a practicality.

- Back-offices of U.S. firms operate in such places as Costa Rica, Ireland and Switzerland.

- Drawings used by American architectural firms are produced in Brazil.

- U.S. firm's call centers are based in India—where employees are now being taught to speak with a mid-western accent.

- U.S. hospitals have x-rays and CAT scans read by radiologists in Australia and India.

- At some McDonald's drive-in windows, orders are transmitted to a processing center a thousand miles away (currently in the U.S.), where they are processed and returned to the worker who actually prepares the order.

- Accounting firms in the U.S. have clients' tax returns prepared by experts in India.

- Visitors to an office not far from the White House are greeted by a receptionist appearing on a flat screen display who controls access to the building and arranges contacts—she is in Pakistan.

- U.S. patients have dental work performed in the Dominican Republic, since an air fare is a minor part of the cost of such treatment.

- Surgeons sit on the opposite side of the operating room and control robots which perform the procedures. It is not a huge leap of imagination to have highly-specialized, world-class surgeons located not just across the operating room but across the oceans.

As Tom Friedman concluded in *The World is Flat*, globalization has "accidentally made Beijing, Bangalore and Bethesda next door neighbors". And the neighborhood is one wherein able candidates for many jobs which currently reside in the U.S. are now just a "mouse-click" away.

How will America compete in this rough and tumble global environment that is approaching much faster than many had expected? The answer appears to be, "not very well"—at least not unless we do a number of things differently from the way we have been doing them in the past. The Red Queen in Lewis Carroll's, "Through the Looking Glass," offers us some sound advice, "Now, *here*, you see, it takes all the running you can do to keep in the same place. If you want to get somewhere else, you must run at least twice as fast as that!"

Why do we reach this conclusion? One need only examine the principal ingredients of competitiveness to discern that not only is the world flat, but in fact it may be tipping *against* us.

One element of competitiveness is, of course, the cost of labor. I recently traveled to Vietnam, where the wrap rate for low-skilled workers is about twenty-five cents per hour, about one-twentieth of the U.S. minimum wage. And the problem is not confined to the so-called "lower-end" of the employment spectrum. For example, five qualified chemists can be hired in India for the cost of just one in America. Eight engineers can be hired in India for the cost of one in America. Given such enormous disadvantages in labor cost, we cannot be satisfied merely to match other economies in those other areas where we do enjoy strength; rather we must excel markedly.

The existence of a vibrant domestic market for products and services is another important factor in determining our nation's competitiveness, since such a market helps attract business to our shores. But here, too, there are warning signs: Goldman Sachs analysts project that within about a decade, fully 80% of the world's *middle-income* consumers will live in nations outside the currently industrialized world. It is projected that in China alone there will be twice as many middle-class consumers as the entire population of the U.S. The availability of financial capital has in the past represented a significant competitive advantage for America. But the evolving mobility of financial capital is legion, as evidenced by the willingness of U.S. firms to build factories in Mexico, Vietnam and China if a competitive advantage can be derived by doing so. Capital, as we have

repeatedly observed, crosses geopolitical borders at the speed of light. Consider that –

- In 2005, American investors put more new money in foreign stock funds than in domestic stock portfolios.[i]

- In 1995 (the most recent year for which data is available), U.S 12th graders performed below the international average for 21 countries on a test of general knowledge in mathematics and science.

- U.S 15-year-olds ranked 24th out of 40 countries that participated in a 2003 examination administered by the Program for International Student Assessment (PISA) of students' ability to apply mathematical concepts to real-world problems.

Human capital—the *quality* of our work force—is a particularly important factor in our competitiveness. Our public school system comprises the foundation of this asset. But as it exists today, that system compares, in the aggregate, abysmally with those of many other developed—and even developing—nations. This is particularly true in the fields which underpin most innovation, namely science, mathematics and technology.

Of the utmost importance to competitiveness is the availability of knowledge capital—"ideas". And once again, scientific research and engineering applications are crucial. But knowledge capital, like financial capital, is highly mobile. There *is* one major difference: being first-to-market, by virtue of access to new knowledge, can be immensely valuable – even if by only a few months. Craig Barrett, a member of our committee and Chairman of Intel, points out that ninety percent of the products his company delivers on December 31st did not even exist on January 1st of that same year. Such is the dependence of hi-tech firms on being at the leading edge of scientific and technological progress. And it is not simply so-called hi-tech firms that share this dependence. For example, the CEO of America's largest consumer products firm has characterized his firm as largely an R&D organization.

There are of course many other factors influencing our nation's competitiveness than those discussed above. These include patent processes, tax policy and overhead costs—such as healthcare, regulation and

litigation—all of which tend to work against us today. On the other hand, America's version of the Free Enterprise System has proven to be a powerful asset, with its inherent aggressiveness in introducing new ideas and discipline and flushing out the obsolescent. But others have now recognized these virtues and are seeking to emulate many of the aspects of our system.

But is it not a *good* thing that others are prospering? Our committee's answer to that question is a resounding "*yes*". Broadly based prosperity can make the world more stable and safer for all; it can make less costly products available for American consumers; it can provide new customers for the products we produce. Yet it is inevitable that there will be relative winners and relative losers—and as the world prospers, we seek to assure that America does not fall behind in the race.

The enigma is that in spite of all these factors, America seems to be doing quite well just now. Our nation has the highest R&D investment intensity in the world. We have indisputably the finest research universities in the world. California alone has more venture capital than any nation in the world other than the United States. Total household net worth is now approaching $50 *trillion*. Two million jobs were created in America in the past year alone, and citizens of other nations continue to invest their savings in America at a remarkable rate.

The reason for this prosperity is that we are reaping the benefits of past investments—many of them in the fields of science and technology. But the early indicators of future prosperity are generally heading in the wrong direction. Consider the following:

- The United States is today a net importer of *high-technology* products. Its trade balance in high-technology manufactured goods shifted from *plus* $54 billion in 1990 to *negative* $50 billion in just 11 years.[ii]
- In one recent period, low-wage employers, such as Wal-Mart (now the nation's largest employer) and McDonald's, created 44% of the new jobs, while high-wage employers created only 29% of the new jobs.[iii]
- The United States is one of the few countries in which industry plays a major role in providing health care for its employees and their families. Starbucks spends more on healthcare than on coffee. General Motors spends more on health care than on steel.[iv]

- Chemical companies closed 70 facilities in the United States in 2004 and tagged 40 more for shutdown. Of 120 chemical plants being built around the world with price tags of $1 billion or more, one is in the United States and 50 are in China. No new refineries have been built in the United States since 1976.[v]
- The share of leading-edge semiconductor manufacturing capacity owned or partly owned by US companies today is half what it was as recently as 2001.[vi]
- During 2004, China overtook the United States to become the leading exporter of information-technology products, according to the OECD.[vii]
- The United States ranks only 12th among OECD countries in the number of broadband connections per 100 inhabitants.[viii]
- In 2001 (the most recent year for which data are available), US industry spent more on tort litigation than on research and development.[ix]
- In 2005, only four American companies ranked among the top 10 corporate recipients of patents granted by the *United States* Patent and Trademark Office.[x]
- Beginning in 2007, the most capable high-energy particle accelerator on Earth will, for the first time, reside outside the United States.[xi]
- Federal funding of research in the physical sciences, as a percentage of GDP, was 45% less in FY 2004 than in FY 1976.[xii]The amount invested annually by the US federal government in research in the physical sciences, mathematics, and engineering combined equals the annual increase in US health care costs incurred every 20 days.[xiii]
- Eight different studies by various economists of the societal benefits from expenditures on research and development reveal returns on investments ranging from 11% to 147%.
- When asked in spring 2005 what is the most attractive place in the world in which to "lead a good life", respondents in only one (India) of the 16 countries polled indicated the United States.[xiv]

As important as jobs are, the impact of these circumstances on our nation's security could be even more profound. In the view of the bipartisan Hart-Rudman Commission on National Security, ". . . the inadequacies of our system of research and education pose a greater threat to U.S. national security over the next quarter century than any potential conventional war that we might imagine." Indeed, the consequences of current trends are

particularly acute for the defense sector, which must rely upon U.S. citizens for much of its engineering force and cannot shift sensitive work to overseas firms. Further, a service economy (which accounts for 75% of today's jobs) is, in general, not the foundation of military equipment and power.

The good news is that there are things we can do to assure that America does in fact share in the prosperity that science and technology are bringing the world. In this regard, our committee has made four broad recommendations as the basis of a prosperity initiative—and offers 20 specific actions to make these recommendations a reality. They should be viewed as an integrated package and include:

- "Ten Thousand Teachers, Ten Million Minds"—which addresses America's K-12 education system. We recommend that America's talent pool in science, math and technology be increased by vastly improving K-12 education. Among the specific steps we propose are:
  - Recruitment of 10,000 new science and math teachers each year through the award of competitive scholarships in math, science and engineering that lead to a bachelor's degree *accompanied by a teaching certificate*—and a 5-year commitment to teach in a public school.
  - Strengthening the skills of 250,000 *current* teachers through funded training and education in part-time master's programs, summer institutes and Advanced Placement training programs.
  - Increasing the number of students who take Advanced Placement science and mathematics courses and pass exams.

- "Sowing the Seeds"—which addresses America's research base. We recommend strengthening the nation's traditional commitment to long-term *basic* research through:
  - Increasing federal investment in research by 10% per year over the next seven years, with primary attention devoted to the physical sciences, engineering, mathematics, and information sciences—without *dis*investing in the health and biological sciences.
  - Providing research grants to early career researchers

- Instituting a National Coordination Office for Research Infrastructure to oversee the investment of an additional $500M per year for five years for advanced research facilities and equipment.
- Allocating at least 8% of the existing budgets of federal research agencies to discretionary funding under the control of local laboratory directors.
- Creation of an Advanced Research Projects Agency—Energy (ARPA-E), modeled after DARPA in the Department of Defense, reporting to the Department of Energy Undersecretary for Science. The purpose is to support the conduct of out-of-the-box, transformational, generic, energy research by universities, industry and government laboratories.
- Establish a Presidential Innovation Award to recognize and stimulate scientific and engineering advances in the national interest.

- "Best and Brightest"—which addresses higher education. In this area we recommend:
  - Establishing 25,000 competitive science, mathematics, engineering, and technology undergraduate scholarships and 5,000 graduate fellowships in areas of national need for US citizens pursuing study at US universities.
  - Providing a federal tax credit to employers to encourage their support of continuing education.
  - Providing a one-year automatic visa extension to international students who receive a science or engineering doctorate at a U.S. university, and providing automatic work permits and expedited residence status if these students are offered employment in the US.
  - Instituting a skill-based, preferential immigration option
  - Reforming the current system of "deemed exports" so that international students and researchers have access to necessary non-classified information or research equipment while studying and working in the US.

- "Incentives for Innovation"—in which we address the innovation environment itself. We recommend:
  - Enhancements to intellectual property protection, such as the adoption of a first-to-file system.
  - Increasing the R&D tax credit from the current 20% to 40%, and making the credit permanent.
  - Providing permanent tax incentives for US-based innovation so that the United States is one of the most attractive places in the world for long-term innovation-related investments.
  - Ensuring ubiquitous broadband Internet access to enable U.S. firms and researchers to operate at the state of the art in this important technology.

The committee notes that, just as when America was faced with the science and technology challenge posed by Sputnik and President Kennedy announced the program to land Americans on the moon, the proposals made herein will best be served by having a "centerpiece goal" – particularly with regard to the proposals affecting research. It is not intended that all the suggested efforts be directed at one particular national goal, but rather that a goal be established to provide a focus under which a central core of research can be pursued. The goal selected by the committee is that of providing the nation with sustainable, safe, clean, secure and affordable energy. This particular choice was made, first, because it represents a highly critical national problem and, second, because the challenge it offers relates closely to those particular aspects of science and technology of greatest concern herein; namely, physics, chemistry, mathematics, computer science and engineering.

Since the Academies' draft report was released in October 2005, the response has been quite remarkable. We are particularly pleased that the President has embraced the challenge we are facing and proposed important actions in his American Competitiveness Initiative (ACI). As you also know, the House and Senate have been very active on this issue both before and after the National Academies report was released. Among the bills proposed is that of Senators Ensign and Lieberman—the National Innovation Act (NIA). This bill, along with the Protecting America's Competitive Edge Act (PACE) proposed by Senators Domenici, Bingaman, Alexander, and Mikulski, are generally harmonious with our

recommendations. All three activities recognize the importance of increasing the nation's investment in research—particularly at the National Science Foundation.

The National Academies does not endorse legislation, but we would like to note that PACE and much of the NIA closely match the actions proposed in the *Gathering Storm* report. For example, the NIA would

- Establish an **Innovation Acceleration Grants Program** which would encourage federal agencies funding research in science and technology to allocate a fraction of their Research and Development (R&D) budgets to grants directed towards high-risk frontier research.

- Increase the national commitment to basic research by nearly doubling research funding for the **National Science Foundation** (NSF) by FY 2011.

- Make permanent the **Research and Experimentation (R&E) tax credit** with modifications expanding eligibility for incentives to a greater number of firms.

- Expand existing educational programs in the physical sciences and engineering by increasing funding for **NSF graduate research fellowship** programs as well as Department of Defense science and engineering scholarship programs.

Today we are not confronting a so-called "typical" crisis, in the sense that there is no 9/11, Sputnik or Pearl Harbor to alert us as a nation. Our situation is more akin to that of the proverbial frog being slowly boiled. Nonetheless, while our committee believes the problem we confront is both real and serious, the good news is that we may well have time to do something about it—if we start now.

Americans, with only 5% of the world's population but with nearly 30% of the world's wealth, tend to believe that scientific and technological leadership and the high standard of living it makes possible is somehow the natural state of affairs for our people. But such good fortune is *not* a birthright. If we wish our children and grandchildren to enjoy the standard of living most Americans have come to expect, there is only one answer: We must get out and *compete*.

I would like to close my remarks with a perceptive and very relevant poem. It was written by Richard Hodgetts, and eloquently summarizes the essence of innovation in the highly competitive, global environment. The poem goes as follows:

Every morning in Africa a gazelle wakes up.
It knows it must outrun the fastest lion or it
will be killed.

Every morning in Africa a lion wakes up.
It knows it must outrun the slowest gazelle
or it will starve.

It doesn't matter whether you're a lion or a
gazelle – when the sun comes up, you'd
better be running.

And indeed we should.

Thank you for providing me with this opportunity to testify on behalf of my colleagues before the committee. I would be pleased to answer any questions you may have about our report.

COMMITTEE BIOGRAPHIC INFORMATION

NORMAN R. AUGUSTINE [NAE*] (Chair) is the retired chairman and CEO of the Lockheed Martin Corporation. He serves on the President's Council of Advisors on Science and Technology and has served as undersecretary of the Army. He is a recipient of the National Medal of Technology.

CRAIG BARRETT [NAE] is chairman of the Board of the Intel Corporation.

GAIL CASSELL [IOM*] is vice president for scientific affairs and a Distinguished Lilly Research Scholar for Infectious Diseases at Eli Lilly and Company.

STEVEN CHU [NAS*] is the director of the E.O. Lawrence Berkeley National Laboratory. He was a cowinner of the Nobel prize in physics in 1997.

ROBERT GATES is the president of Texas A&M University and served as Director of Central Intelligence.

NANCY GRASMICK is the Maryland state superintendent of schools.

CHARLES HOLLIDAY JR. [NAE] is chairman of the Board and CEO of DuPont.

SHIRLEY ANN JACKSON [NAE] is president of Rensselaer Polytechnic Institute. She is the immediate past president of the American Association for the Advancement of Science and was chairman of the US Nuclear Regulatory Commission.

ANITA K. JONES [NAE] is the Lawrence R. Quarles Professor of Engineering and Applied Science at the University of Virginia. She served as director of defense research and engineering at the US Department of Defense and was vice-chair of the National Science Board.

JOSHUA LEDERBERG [NAS/IOM] is the Sackler Foundation Scholar at Rockefeller University in New York. He was a cowinner of the Nobel prize in physiology or medicine in 1958.

RICHARD LEVIN is president of Yale University and the Frederick William Beinecke Professor of Economics.

C. D. (DAN) MOTE JR. [NAE] is president of the University of Maryland and the Glenn L. Martin Institute Professor of Engineering.

CHERRY MURRAY [NAS/NAE] is the deputy director for science and technology at Lawrence Livermore National Laboratory. She was formerly the senior vice president at Bell Labs, Lucent Technologies.

PETER O'DONNELL JR. is president of the O'Donnell Foundation of Dallas, a private foundation that develops and funds model programs designed to strengthen engineering and science education and research.

LEE R. RAYMOND [NAE] is the chairman of the Board and CEO of Exxon Mobil Corporation.

ROBERT C. RICHARDSON [NAS] is the F. R. Newman Professor of Physics and the vice provost for research at Cornell University. He was a cowinner of the Nobel prize in physics in 1996.

P. ROY VAGELOS [NAS/IOM] is the retired chairman and CEO of Merck & Co., Inc.

CHARLES M. VEST [NAE] is president emeritus of MIT and a professor of mechanical engineering. He serves on the President's Council of Advisors on Science and Technology and is the immediate past chair of the Association of American Universities.

GEORGE M. WHITESIDES [NAS/NAE] is the Woodford L. & Ann A. Flowers University Professor at Harvard University. He has served as an adviser for the National Science Foundation and the Defense Advanced Research Projects Agency.

RICHARD N. ZARE [NAS] is the Marguerite Blake Wilbur Professor of Natural Science at Stanford University. He was chair of the National Science Board from 1996 to 1998.

NORMAN R. AUGUSTINE was raised in Colorado and attended Princeton University where he graduated with a BSE in Aeronautical Engineering, magna cum laude, an MSE and was elected to Phi Beta Kappa, Tau Beta Pi and Sigma Xi.

In 1958 he joined the Douglas Aircraft Company in California where he held titles of Program Manager and Chief Engineer. Beginning in 1965, he served in the Pentagon in the Office of the Secretary of Defense as an Assistant Director of Defense Research and Engineering. Joining the LTV Missiles and Space Company in 1970, he served as Vice President, Advanced Programs and Marketing. In 1973 he returned to government as Assistant Secretary of the Army and in 1975 as Under Secretary of the Army and later as Acting Secretary of the Army. Joining Martin Marietta Corporation in 1977, he served as Chairman and CEO from 1988 and 1987, respectively, until 1995, having previously been President and Chief Operating Officer. He served as President of Lockheed Martin Corporation upon the formation of that company in 1995, and became its Chief Executive Officer on January 1, 1996, and later Chairman. Retiring as an employee of Lockheed Martin in August, 1997, he joined the faculty of the Princeton University School of Engineering and Applied Science where he served as Lecturer with the Rank of Professor until July, 1999.

Mr. Augustine served as Chairman and Principal Officer of the American Red Cross for nine years and as Chairman of the National Academy of Engineering, the Association of the United States Army, the Aerospace Industry Association, and the Defense Science Board. He is a former President of the American Institute of Aeronautics and Astronautics and the Boy Scouts of America. He is a current or former member of the Board of Directors of ConocoPhillips, Black & Decker, Procter & Gamble and Lockheed Martin and is a member of the Board of Trustees of Colonial Williamsburg, a Trustee Emeritus of Johns Hopkins and a former member of the Board of Trustees of Princeton and MIT. He is a member of the President's Council of Advisors on Science and Technology and the Advisory Board to the Department of Homeland Security and was a member of the Hart/Rudman Commission on National Security. He is a member of the American Philosophical Society, the Council on Foreign Affairs, and a Fellow of the National Academy of Arts and Sciences.

Mr. Augustine has been presented the National Medal of Technology by the President of the United States and has five times been awarded the Department of Defense's highest civilian decoration, the Distinguished Service Medal and has received the Joint Chiefs of Staff Distinguished Public Service Award. He is co-author of *The Defense Revolution* and *Shakespeare In Charge* and author of *Augustine's Laws* and *Augustine's Travels.* He holds 19 honorary degrees and was selected by Who's Who in America and the Library of Congress as one of the Fifty Great Americans on the occasion of Who's Who's fiftieth anniversary. He has traveled in nearly 100 countries and stood on both the North and South Poles.

Notes:

[i] Paul J. Lim. *Looking Ahead Means Looking Abroad.* New York Times. January 8th 2006.

[ii] For 2001, the dollar value of high-technology imports was $561 billion; the value of high-technology exports was $511 billion. See National Science Board. 2004. *Science and Engineering Indicators 2004* (NSB 04-01). Arlington, Virginia. National Science Foundation. Appendix Table 6-01. Page A6-5 provides the export numbers for 1990 and 2001 and page A6-6 has the import numbers.

[iii] Steve Roach.. *More Jobs, Worse Work.* New York Times. July 22, 2004.

[iv] Chris Noon. 2005. "Starbuck's Schultz Bemoans Health Care Costs." *Forbes.com*, September 19. Available at: http://www.forbes.com/facesinthenews/2005/09/15/starbucksshealthcarebenefitscx_cn_0915autofacescan01.html?partner=yahooti; Ron Scherer. 2005. "Rising Benefits Burden." *Christian Science Monitor,* June 9. Available at: http://www.csmonitor.com/2005/0609/p01s01-usec.html

[v] Michael Arndt. 2005. "No Longer the Lab of the World: U.S. Chemical Plants are Closing in Droves as Production Heads Abroad." *BusinessWeek,* May 2. Available at: http://www.businessweek.com/magazine/content/05_18/b3931106.htm and http://www.usnews.com/usnews/biztech/articles/051010/10energy.htm

[vi] Semiconductor Industry Association. 2005. "Choosing to Compete." December 12. Available at: http://www.sia-online.org/downloads/FAD%20'05%20-%20Scalise%20Presentation.pdf>>

[vii] OECD. 2005. "China Overtakes U.S. As World's Leading Exporter of Information Technology Goods." December 12.
Available at: http://www.oecd.org/document/60/0,2340,en_2649_201185_35834236_1_1_1_1,00.html. The main categories included in OECD's definition of ICT (information and communications technology) goods are electronic components, computers and related equipment, audio and video equipment and telecommunication equipment.

[viii] OECD. 2005. "OECD Broadband Statistics, June 2005." October 20. Available at: http://www.oecd.org/document/16/0,2340,en_2649_201185_35526608_1_1_1_1,00.html#data2004

[ix] US research and development spending in 2001 was $273.6 billion, of which industry performed $194 billion and funded about $184 billion. National Science Board. 2004. *Science and Engineering Indicators 2004* (NSB 04-01). Arlington, VA: National Science Foundation. One estimate of tort litigation costs in the United States was $205 billion in 2001.
Jeremey A. Leonard. 2003. "How Structural Costs Imposed on U.S. Manufacturers Harm Workers and Threaten Competitiveness." Prepared for the Manufacturing Institute of the National Association of Manufacturers. Availbale at: http://www.nam.org/s_nam/bin.asp?CID=216&DID=227525&DOC=FILE.PDF.

[x] US Patent and Trademark Office2006. USPTO Annual List of Top 10 Organizations Receiving Most U.S. Patents. January 10, 2006. http://www.uspto.gov/web/offices/com/speeches/06-03.htm

[xi] CERN. Internet Homepage. http://public.web.cern.ch/Public/Welcome.html.

[xii] AAAS. 2004. "Trends in Federal Research by Discipline, FY 1976-2004." October. Available at: http://www.aaas.org/spp/rd/disc04tb.pdf and http://www.aaas.org/spp/rd/discip04c.pdf

[xiii] Centers for Medicare and Medicaid Services. 2005. *National Heath Expenditures.* Available at: http://www.cms.hhs.gov/NationalHealthExpendData/downloads/tables.pdf

[xiv] Pew Research Center. 2005 "U.S. Image Up Slightly, But Still Negative, American Character Gets Mixed Reviews" Pew Global Attitudes Project. Washington, DC. Available at: http://pewglobal.org/reports/display.php?ReportID=247
The interview asked nearly 17,000 people the question: "Supposed a young person who wanted to leave this country asked you to recommend where to go to lead a good life – what country would you recommend ?" Except for respondents in India, Poland, and Canada, no more than one-tenth of the people in the other nations said they would recommend the United States. Canada and Australia won the popularity contest.